ORPHEE
19, chemin du champ-des-filles
CH-1228 Geneva / Plan-les-Ouates
SWITZERLAND

Tel : +41 (0) 22 706 1840
Fax : +41 (0) 22 794 4391
http://www.orphee-medical.com

MYTHIC 18

SERVICE MANUAL

REF : M18-SM-001 Rev 02

Copyright© Orphée SA. All Rights Reserved.

REVISIONS

Revision Nb	Date	Author	Software	Comments
01	19/07/04	HC	V 0.6x	Creation
02	28/02/05	HC	V 1.0X	Update of all parts

CONTACT ADDRESS

MANUFACTURER

M

C2 Diagnostics
2214, Bd de la Lironde
34397 Montpellier Cedex 5
FRANCE

AUTHORIZED REPRESENTATIVE

WORLDWIDE

ORPHEE SA
19, chemin du champ-des-filles
CH-1228 Geneva / Plan-les-Ouates
SWITZERLAND

Tel : +41 (0) 22 706 1840
Fax : +41 (0) 22 794 4391
http://www.orphee-medical.com

LOCAL REPRESENTATIVE

 Copyright© Orphée SA. All Rights Reserved.

IMPORTANT SAFETY INSTRUCTIONS

	RISK OF DANGER ! Indicates a procedure to be strictly respected in order to avoid any risks for the operator (user) or damages on the instrument or on the quality of results.

	Indicates that wearing gloves is mandatory before performing the described operation due to risk of contact with materials that may be infectious.

NOTA : Indicates important additional information.

	BEFORE TO INSTALL OR TO MAINTAIN A MYTHIC 18 YOU HAVE TO READ AND TO REFER TO THE USER'S MANUAL. **OPERATORS MUST HAVE RECEIVED ADEQUATE TRAINING.**

	BE CAREFUL WITH THE EDGE OF THE METAL SHEETS AFTER HAVING DISMANTLED THE COVERS.

 Copyright© Orphée SA. All Rights Reserved.

This equipment needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information listed below

Guidance and manufacturer's declaration – Electromagnetic immunity			
The MYTHIC 18 is intended for use in the electromagnetic environment specified below. The customer or the user of the MYTHIC 18 should assure that it is used in such environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment - guidance**
			Portable and mobile RF communications equipment should be used no closer to any part of the MYTHIC 18, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance**
Conducted RF IEC 61000-4-6	3 Vrms 150Khz to 80Mhz	3 Vrms	$d = 1,2\sqrt{P}$
Radiated RF IEC 61000-4-3	3 Vrms 80Mhz to 2,5Ghz	3 Vrms	$d = 1,2\sqrt{P}$ 80MHz to 800MHz $d = 2,3\sqrt{P}$ 800MHz to 2,5GHz Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strenghts from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol:
NOTE 1 At 80Mhz and 800MHz, the higher frequency range apllies. NOTE 2 Theses guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
[a] Field strenghts from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM an FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should considered. If the measured field strenght in the location in which the MYTHIC 18 is used exceeds the applicable RF compliance level above, the MYTHIC 18 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the MYTHIC 18. [b] Over the frequency range 150KHz to 80MHz, field strenghts should be less than 3V/m.			

 Copyright© Orphée SA. All Rights Reserved.

DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITE

WE THE MANUFACTURER
NOUS LE FABRICANT

NAME / *NOM*: **C2 DIAGNOSTICS**

ADDRESS / *ADRESSE*:
Parc Agropolis II, Bâtiment 14
2214, bd de la Lironde
34397 MONTPELLIER CEDEX 5
FRANCE

DECLARE THAT THE PRODUCT
DECLARONS QUE LE PRODUIT

NAME OF THE MODEL / *NOM DU MODEL*: **MYTHIC 18**

CONFORMS TO THE FOLLOWING DIRECTIVE & STANDARDS
EST CONFORME A LA DIRECTIVE ET AUX NORMES SUIVANTES

DIRECTIVE: 98/79/CE (IVD Medical devices)

STANDARDS:
IEC 60601-1-2 (2001)
EN 61000-3-2
EN 61000-3-3
EN 61000-4-2 (95) A1 (98) A2 (01)
EN 61000-4-3 (02)
EN 61000-4-4 (95) A1(01)
EN 61000-4-5 A1 (01)
EN 61000-4-6 (96) A1 (01)
EN 61000-4-11 (94) A1 (01)
EN 55011 Class B
EN 55022 Class B
IEC 61010-1 (2001)
IEC 61010-2-081 (2001)
IEC 61010-2-101 (2002)

Henri CHAMPSEIX
CEO
Président Directeur Général

FormDeclar (Version 04)

JUIN 2004

Copyright© Orphée SA. All Rights Reserved.

TABLE OF CONTENTS

1. INTRODUCTION 8

2. FLUIDICS 9

2.1 GENERALITIES 9
2.2 FLUIDICS SEQUENCES DESCRIPTION : 9
2.3 FLUIDICS VIEW 11
2.4 FLUIDICS PARTS DESCRIPTION 12
2.4.1 Sampling module 12
2.4.2 Counting bath module 12
2.4.3 Syringes module 12
2.5 FLUIDICS DIAGRAM 13
2.5.1 General Diagram 13
2.5.2 Manifold tubing position 14
2.6 SIZE & LENGTH TUBING 15

3. ELECTRIC & ELECTRONIC 16

3.1 GENERALITIES 16
3.2 ELECTRICS PARTS VIEW 16
3.2.1 Main board 16
3.2.2 GUI board 17
3.2.3 Preamplifier board 17
3.2.4 Power supply block 17
3.3 ELECTRONIC DIAGRAM 18
3.4 WIRING DIAGRAM 19
3.4.1 General view 19
3.4.2 Stepper motor 20
3.4.3 Rocker optical sensor 21
3.4.4 Syringe optical sensor 22
3.4.5 Needle optical sensor 23
3.4.6 Syringe valve cable 24
3.4.7 Counting valve cable 25
3.4.8 Start key switch 26
3.4.9 Fluidic door switch 27
3.4.10 Temperature sensor 28

4. SPECIFICATIONS 29

4.1 ANALYTICAL SPECIFICATIONS 29
4.2 REAGENTS SPECIFICATIONS 29
4.3 LIMITATIONS 29

5. OUTPUT FORMAT 30

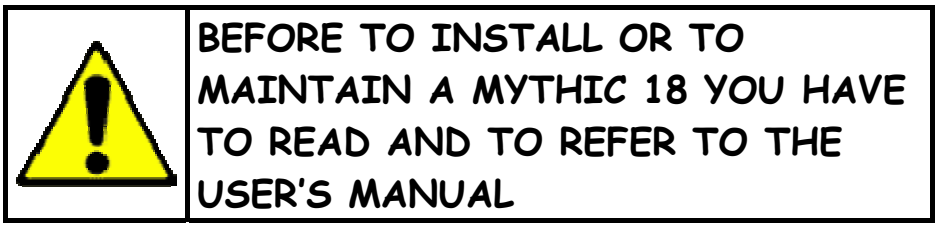
5.2 C2 FORMAT 30
5.2.1 General principle 30
5.2.2 FRAMES 30
5.2.2.1 REQUEST TO SEND RESULTS 30
5.2.2.1.1 Request to send results 30
5.2.2.1.2 ACKNOWLEDGEMENT REQUEST TO SEND RESULTS 30
5.2.2.1.3 ACKNOWLEDGEMENT RESULTS 30
5.2.2.2 ROUTINE RESULTS 31
5.2.2.2.1 Alarm list. 32
5.2.2.2.2 WBC pathologic alarms 32
5.2.2.2.3 RBC pathologic messages 33
5.2.2.2.4 PLT pathologic messages 33
5.2.2.3 CALIBRATION 33
5.2.2.3.1 Results 34
5.2.2.4 QC 34
5.2.2.4.1 Results 34
5.2.2.5 REPEATABILITY 35

 Copyright© Orphée SA. All Rights Reserved.

5.2.2.5.1 Results 35
5.2.3 CHECKSUM 35
6. PARTS LIST & BLOW UP VIEW 37
6.1 PARTS LIST 37
6.1.2 Two years spare parts kit 37
6.1.2 Maintenance kit 37
6.1.2 O-rings kit 38
6.1.2 Tubing kit 38
6.1.2 All spare parts 39
6.2 BLOW UP VIEW 41
6.2.1 Counting Module 41
6.2.2 Sampling Module 42
6.2.3 Syringe Module 43
6.2.4 CPU-PREAMPLIFIER Module 46
6.2.5 Front cover Module 47
7. SOFTWARE 48
7.1 INTRODUCTION 48
7.2 SPECIFIC TECHNICIAN DISPLAY 48
7.2.1 Technician password 48
7.2.2 Technician display 48
7.2.2.1 Technician 48
7.2.2.2 Counting parameters 49
7.2.2.3 Prod. adjust 49
7.2 SOFTWARE ARBORESCENCE 50
8. MAINTENANCE 51
8.1 MAINTENANCE TABLE 51
8.2 CONCENTRATED CLEANING 52
8.3 CLEAN OUT 53
9. REPAIRING 54
9.1 EMERGENCY STOP 54
9.2 SAMPLING MODULE 54
9.2.1 Needle replacement 54
9.2.2 Complete rocker module replacement 54
9.3 COUNTING BATHS MODULE 56
9.3.1 Baths dismantling 56
9.3.2 Baths o-ring replacement 56
9.3.3 Aperture block replacement 56
9.3.4 Complete baths module replacement 56
9.4 SYRINGE MODULE 57
9.4.1 Piston greasing 57
9.4.2 O-ring or piston replacement 57
9.4.3 Complete syringe module replacement 58
9.5 BOARDS REPLACEMENT 59
9.5.1 GUI board replacement 59
9.5.2 Main board replacement 61
9.5.3 Main board 63
9.5.3.1 Fuse replacement 63
9.5.3.2 Battery replacement 63
9.5.4. Preamplifier board replacement 65
10. TROUBLESHOOTING 66
10.1 ANALYTICAL PROBLEMS 66
10.2 OTHER PROBLEMS 66
10.3 TROUBLESHOOTING MESSAGE 67

 Copyright© Orphée SA. All Rights Reserved.

1. INTRODUCTION



The following chapters describe the different technical parts of the MYTHIC 18

- Fluidic
- Electric & electronic
- Technical specification
- Output format
- Spare parts list and blowup view
- Maintenance procedure

Copyright© Orphée SA. All Rights Reserved.

2. FLUIDICS

2.1 GENERALITIES

MYTHIC 18 is a fully automated analyzer performing hematological analysis on whole blood.
The human blood venous sample must be collected in an EDTA **K3** (Ethylene Diamine Tetracetic Acid, tri potassic) tube in sufficient quantity. The LMG results are available for **six hours** after the blood draw. The use of EDTA K2 leads to a poor quality level of the LMG results.
It must be correctly homogenized before analysis. It is recommended to use a rotary agitator turning between 20 to 30 turns/mn during **10 minutes**.

A volume of insufficient blood for the quantity of anticoagulant or a bad mixing may involve an erroneous result.

Two dilution rate are performed :
~1/237 to 1/257 for WBC/HB (depend of the lysis quantity, see section 7.2.2.2)
~1/15000 for RBC/PLT

2.2 FLUIDICS SEQUENCES DESCRIPTION :

SAMPLING SEQUENCE :
1- Syringes down : (no valve)
~Less than 9,8 µl of blood sample are draw inside the sampling needle
Diluent prime
Vacuum prime
2- Needle up and syringe up (valve 3+4)
Needle outside cleaning with diluent and waste vacuum
3-Rocker move above the WBC bath
and the syringes up to drain the waste (valve 7)
4- Needle down to the rinsing position
5- Syringe down
WBC bath drain (valve 1)
6- Syringe up
Second outside needle cleaning (valve 4)
Waste syringe drain (valve 7)
7- Syringe down
WBC bath drain (valve 1)
8- Syringe up
Waste syringe drain (valve 7)

WBC DILUTION :
9- Needle down to the dilution position
and the syringes down to prime the diluent (valve 8)
10- Syringe up for the WBC dilution (~2 ml)
Diluent outside of the needle (valve 4)
Diluent inside the needle (valve 4+5)
Bubble to mix the dilution (valve 1)

RBC DILUTION AND LYSING :
11- Syringe down (no valve)
Drawing sample of the first dilution (~20µl)

 Copyright© Orphée SA. All Rights Reserved.

Diluent prime
Vacuum prime
12- Needle up and syringe up
Rocker move above the RBC bath
Needle outside cleaning with diluent and waste vacuum (valve 3+4)
13- Needle down to the rinsing position
14 Syringe up
Second outside needle cleaning (valve 4+8)
Lysis in the WBC bath (0,3 to 0,5ml) (valve 9)
Bubble to mix the dilution (valve 1)
15 Syringe down
RBC bath drain (valve 2)
16- Needle down to the dilution position
17- Syringe up for the RBC dilution (~1,5ml)
Waste syringe drain (valve 7)
Diluent outside of the needle (valve 4+8)
Diluent inside the needle (valve 5)
Bubble to mix the dilution and diluent to rinse the counting head (valve 6+10+2)

MEASUREMENTS :
18- Syringe down to process the vacuum counting (valve 10)
19- First measurement sequences (valve 10)
20- Syringe up
Diluent back pressure (valve 4+6)
21- Syringe down to perform the vacuum counting (valve 10)
22- Second measurement sequences (valve 10)

DRAIN AND RINSE BATH :
22- Syringe down
Cleaning the apertures (valve 11)
WBC bath drain (valve 1)
RBC bath drain (valve 2)
23- Syringe up
RBC bath rinse diluent (valve 4)
Waste syringe drain (valve 7)
24- Needle up and syringes up for back flush (valve 4+6)
25- Rocker move above the WBC bath
26- Syringe up
WBC bath rinse diluent (valve 4)
Waste syringe drain (valve 7)

NEEDLE BACK AND WASTE DRAIN :
27- Syringe down
Dry the outside of the needle (valve 3)
28- Rocker move in the sampling position
26- Syringe up
Waste syringe drain (valve 7)
30- Needle down in sampling position

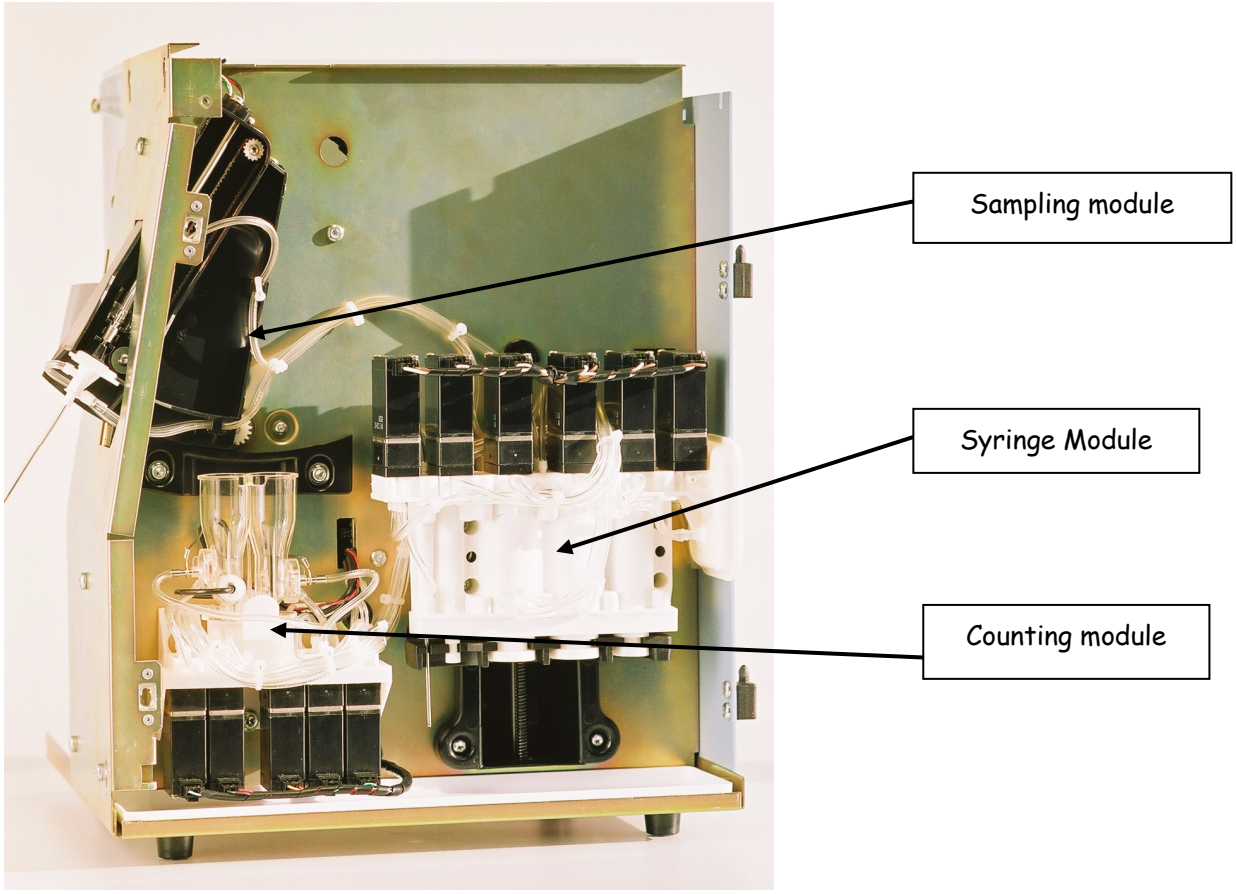
The MYTHIC 18 is ready to perform a new analyze.

 Copyright© Orphée SA. All Rights Reserved.

2.3 FLUIDICS VIEW

All the fluidics part is on the right side of the instrument and consists of only three modules :

- Sampling module :
  - Rocker (patent pending) : Manages the rise and descent of the needle.
- Syringe module (patent pending) consists of one block :
  - Reagent syringes (Diluent, lysis), sampling and air syringes.
  - Liquid valve manifold assembly and tubing.
- Counting chambers :
  - WBC and RBC counting chambers and hemoglobin measurement.
  - Liquid valve manifold assembly and tubing.



Copyright© Orphée SA. All Rights Reserved.

2.4 FLUIDICS PARTS DESCRIPTION

The hydraulic part of the **MYTHIC 18** is very simple and made of only three modules :

- Sampling module.
- Counting bath module.
- Syringes module.

The modules are connected together by semi rigid tubing.

2.4.1 Sampling module

This module (patent pending) enables to draw the sample and to perform the WBC and RBC/PLT dilutions.
It is assembled with a rotating rocker moving around a support which maintains the system to move up and down the sampling needle.
A very reliable system of rack-gear moves the rocker.
The cleaning system of the sampling needle can be removed without tool (see section **9.3.2** in the user manual).
The o-ring of the needle included in the cleaning system can also be removed without tool (see section **9.3.2** in the user manual).
The maintenance of these parts is very easy to perform.

2.4.2 Counting bath module

This module allows to count the WBC and RBC/PLA and to measure the HGB.
It is made with a manifold maintaining the reagent commutation valves and the counting bath block with their measurement block including the apertures.
The counting bath block assembly and these apertures can be removed without tool (see section **9.3.3/4/5** in the user manual).

2.4.3 Syringes module

This module (patent pending) enables :

to draw the sample
to distribute the reagents
to drain the baths
to do the vacuum necessary for counting
and to push the waste to the waste container.

It is made with a manifold maintaining the fluid commutation valves and with the syringes bloc including five syringes :

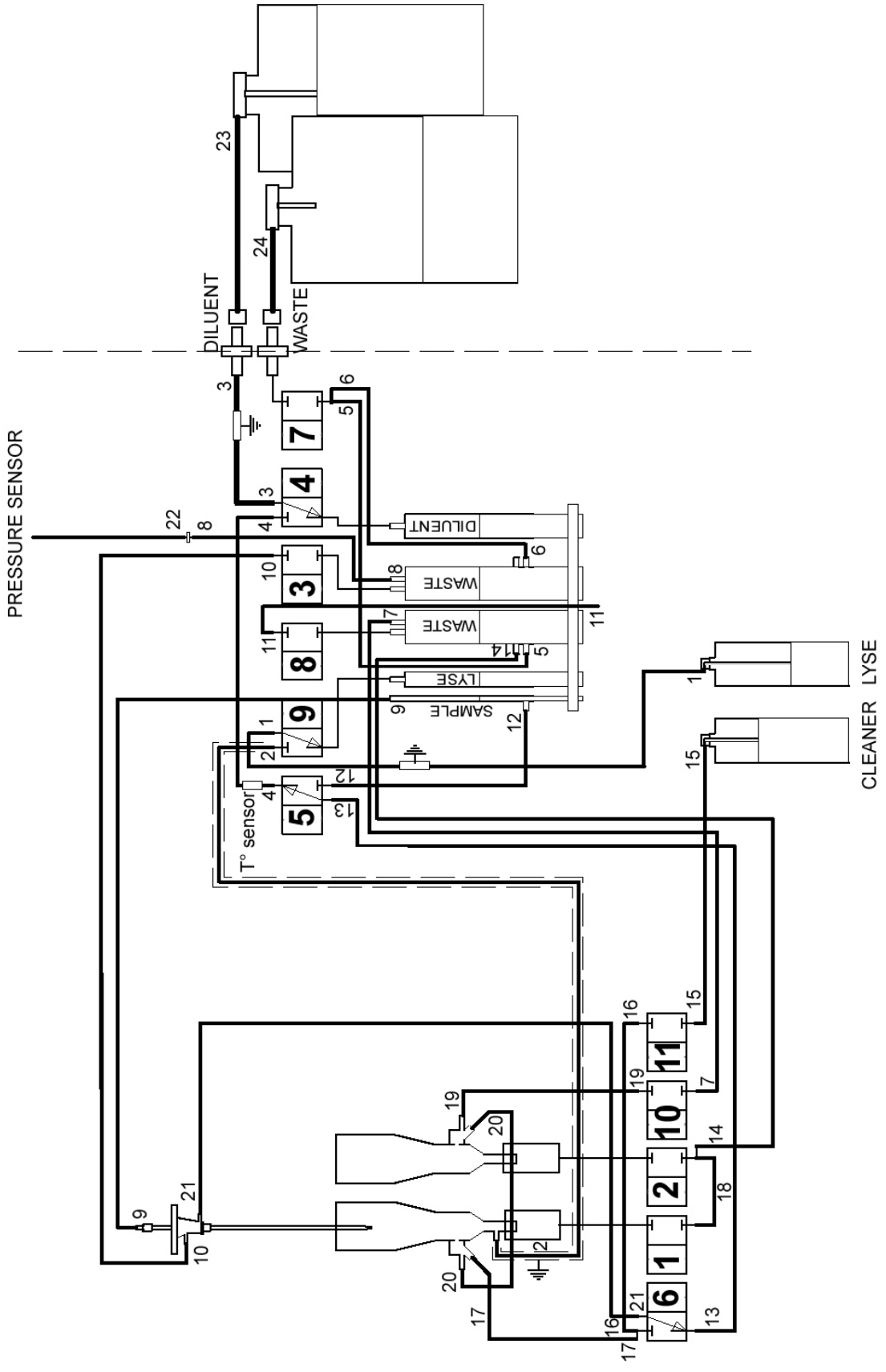
The sampling syringe
The lysis syringe
The two waste and vacuum/pressure syringes
And the diluent syringe.

Only one motor drives the five syringes.
The diluent input and the waste output are also included in this manifold.

 Copyright© Orphée SA. All Rights Reserved.

2.5 FLUIDICS DIAGRAM

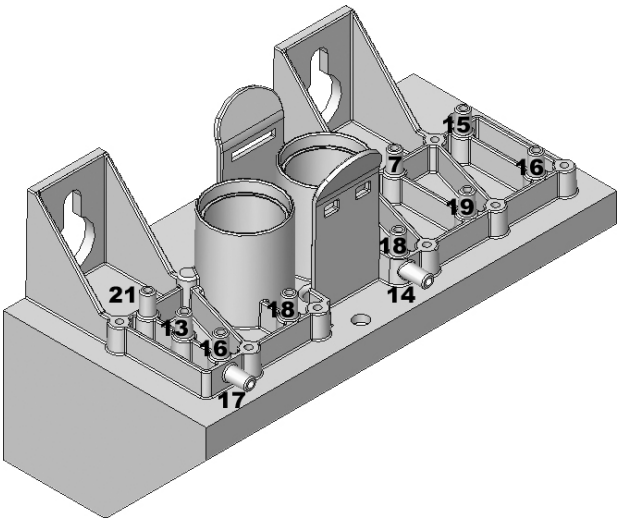
2.5.1 General Diagram



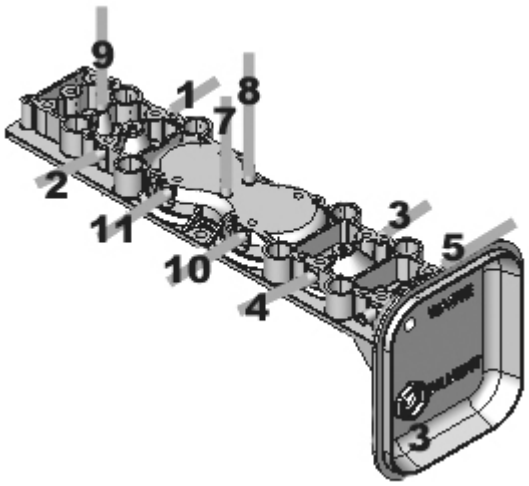
Copyright© Orphée SA. All Rights Reserved.

2.5.2 Manifold tubing position

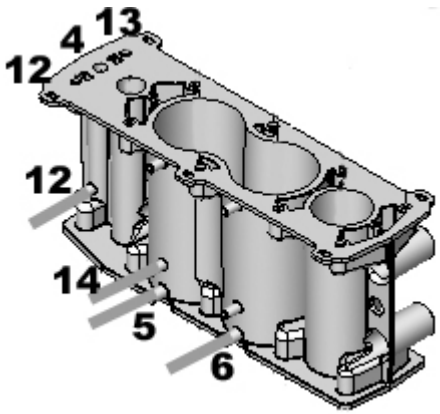
Each figure corresponds to a tubing number (see the Fluidic diagram section 2.5.1)



Counting manifold



Syringe manifold



Syringe body

 Copyright© Orphée SA. All Rights Reserved.

2.6 SIZE & LENGTH TUBING

To ensure perfect results it is mandatory to respect the size and the length of the tubing.

			Tygon tubing 0,8x2,4mm	Tygon tubing 1,3x3mm	Tygon tubing 1,6x3,2mm	Tygon tubing 2x4mm	Tygon tubing 3x6mm	Tygon tubing 5x8mm
Part Number	**REV**	**Designation**						
005-1001-90 01 01	A	Tubing 1-1			820mm			
005-1001-90 01 02	A	Tubing 1-2			180mm			
005-1001-90 02	A	Tubing 2			250mm			
005-1001-90 03 01	A	Tubing 3-1				135mm		
005-1001-90 03 02	A	Tubing 3-2				20mm		
005-1001-90 04 01	A	Tubing 4-1				175mm		
005-1001-90 04 02	A	Tubing 4-2				15mm		
005-1001-90 05	A	Tubing 5				210mm		
005-1001-90 06	A	Tubing 6				170mm		
005-1001-90 07	B	Tubing 7			220mm			
005-1001-90 08	A	Tubing 8			80mm			
005-1001-90 09	B	Tubing 9		425mm				
005-1001-90 10 01	B	Tubing 10-1				8mm		
005-1001-90 10 02	A	Tubing 10-2	370mm					
005-1001-90 11	A	Tubing 11				90mm		
005-1001-90 12	A	Tubing 12			60mm			
005-1001-90 13	A	Tubing 13			250mm			
005-1001-90 14	B	Tubing 14			250mm			
005-1001-90 15	A	Tubing 15			1000mm			
005-1001-90 16	A	Tubing 16			130mm			
005-1001-90 17	A	Tubing 17			80mm			
005-1001-90 18	A	Tubing 18			80mm			
005-1001-90 19	A	Tubing 19			80mm			
005-1001-90 20	A	Tubing 20			130mm			
005-1001-90 21	B	Tubing 21			600mm			
005-1001-90 22	A	Tubing 22		200mm				
005-1001-90 23	A	Tubing 23 - DILUENT					1500mm	
005-1001-90 24	A	Tubing 24 - WASTE					1500mm	
005-1001-90 25	A	Tubing 25						55mm (45°)
005-1001-90 26	A	Tubing 26						5mm
005-1001-90 016 032	A	Tygon Tubing L=1000mm 1,6x3.2mm			1000mm			
005-1001-90 020 040	A	Tygon Tubing L=500mm 2x4mm				500mm		
005-1001-90 030 060	A	20L Tubing Straw adaptor					100mm	

 Copyright© Orphée SA. All Rights Reserved.

3. ELECTRIC & ELECTRONIC

3.1 GENERALITIES

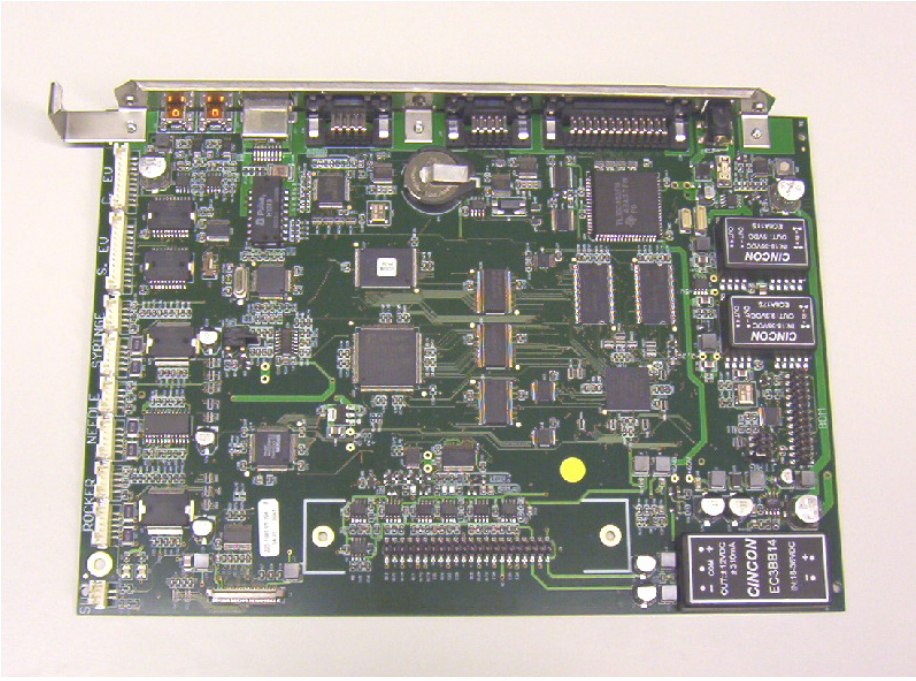
Only three boards compose the MYTHIC 18 :

- the main board
- the preamplifier board
- and the GUI board

	- In the case of replacement of the main board or preamplifier board, be aware of the sensibility of this board to the electrical static discharge (ESD). **- Before operating check the earth connection and use the antistatic bag supply with the board. Please contact your Orphée for more information.** **- Be careful with the edge of the metal sheets after having dismantled the covers.**

3.2 ELECTRICS PARTS VIEW

3.2.1 Main board

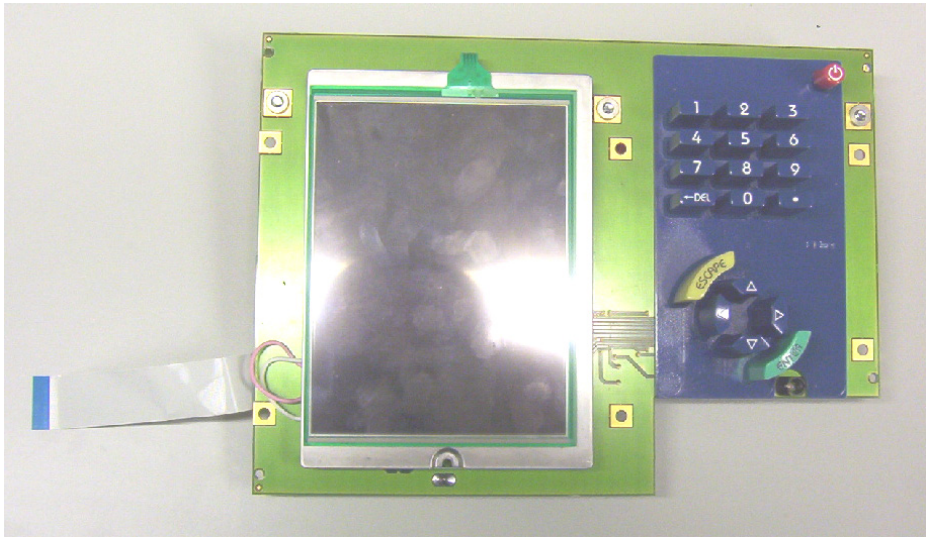


The mono electronic board is located between the hydraulic part and the reagent tray.
The board, driven by a 32-bit processor, manages the following parts :

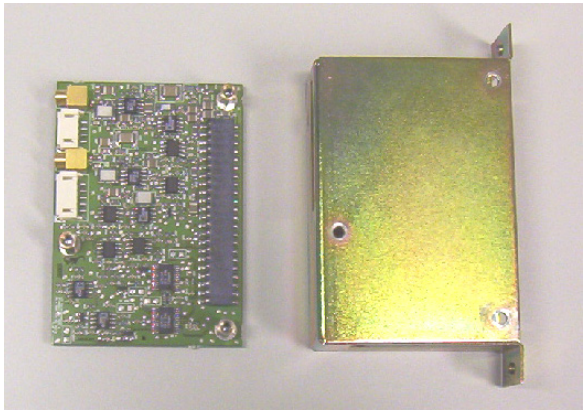
- Sample needle, rocker, syringe block motors.
- Display and keyboard.
- Connexion mode (RS232, Ethernet, …).
- Printer.
- Measurement (Counting, hemoglobin measurement).
- Data processing.
- External barcode reader.

Copyright© Orphée SA. All Rights Reserved.

3.2.2 GUI board



3.2.3 Preamplifier board



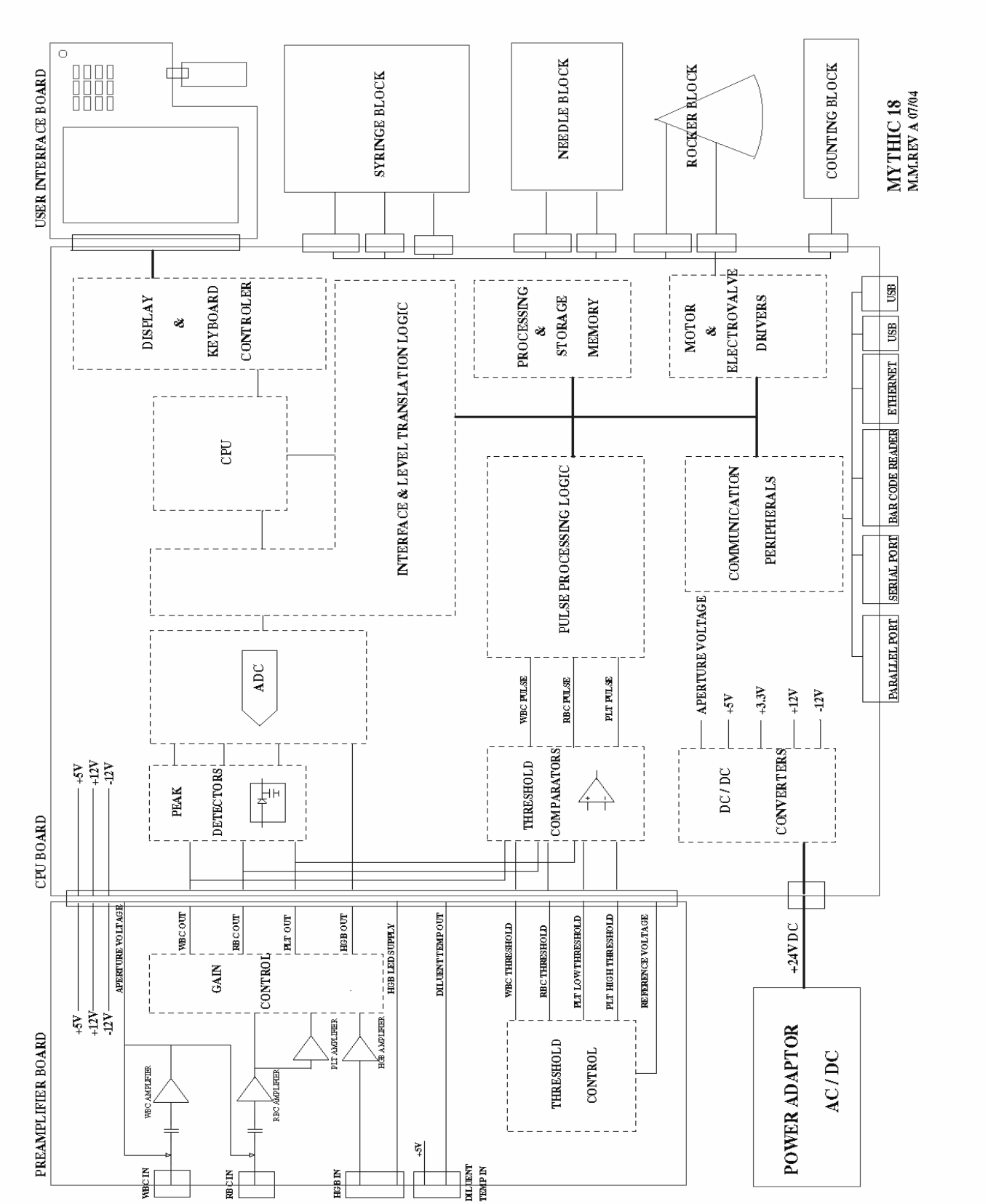
3.2.4 Power supply block

MYTHIC 18 is supplied with an external power supply block.

	- In case of replacement of the main power wire supplied with the MYTHIC 18, the new one must comply with the local regulation. **- The MYTHIC 18 has been certified with the power supply box provided with the machine. The use of another external power supply box is not guaranteed. Please contact Orphée.**

 Copyright© Orphée SA. All Rights Reserved.

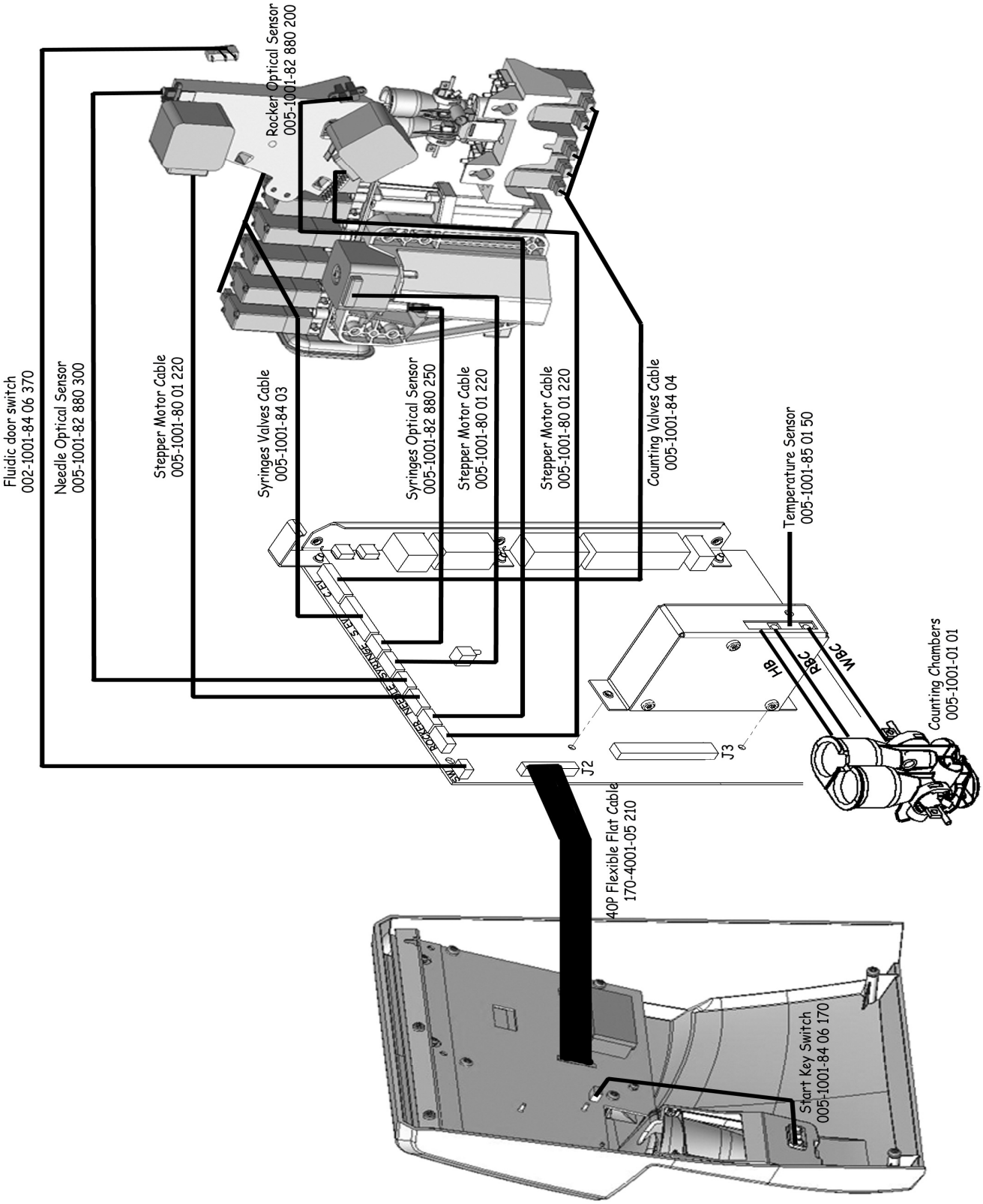
3.3 ELECTRONIC DIAGRAM



 Copyright© Orphée SA. All Rights Reserved.

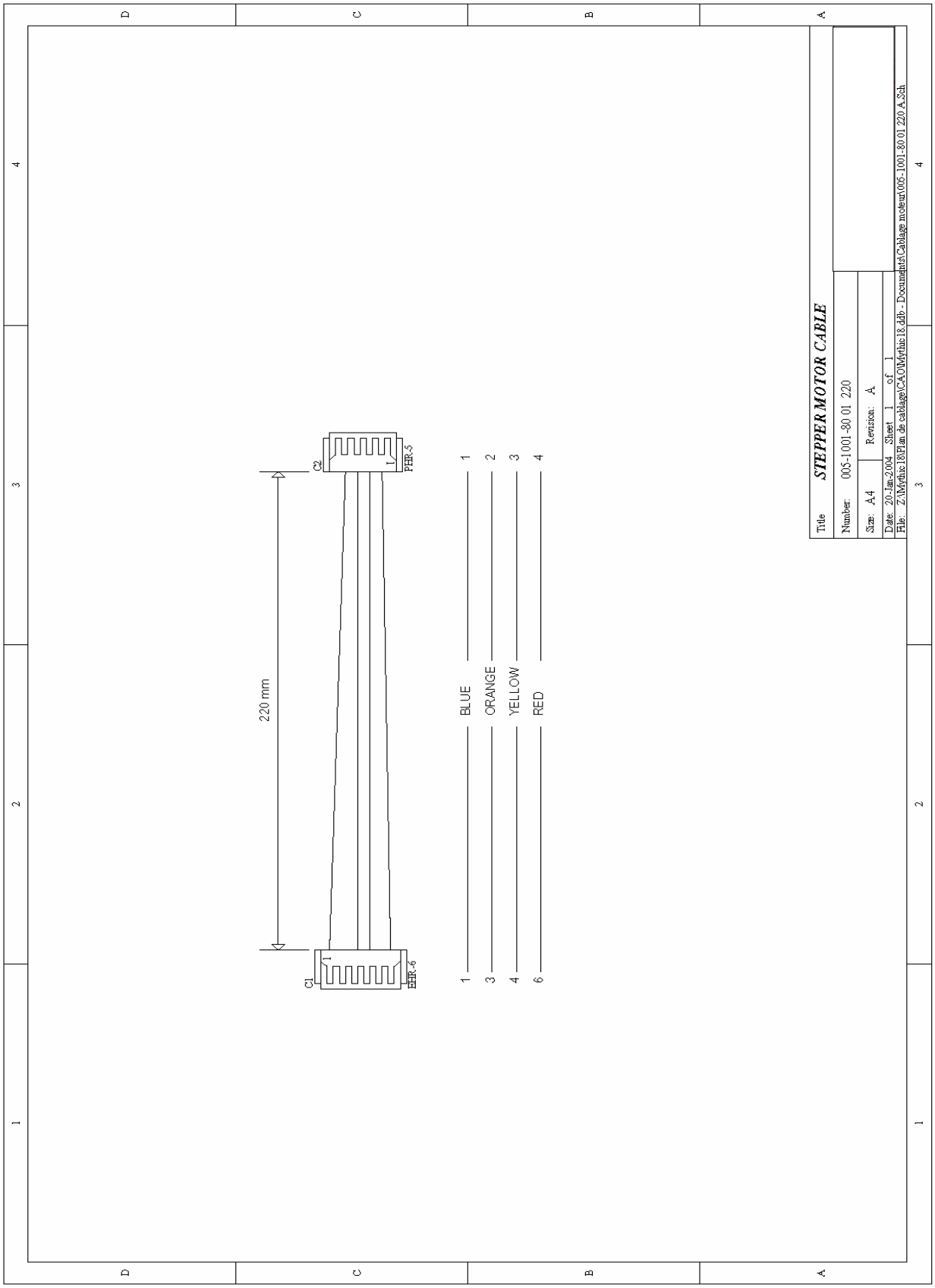
3.4 WIRING DIAGRAM

3.4.1 General view



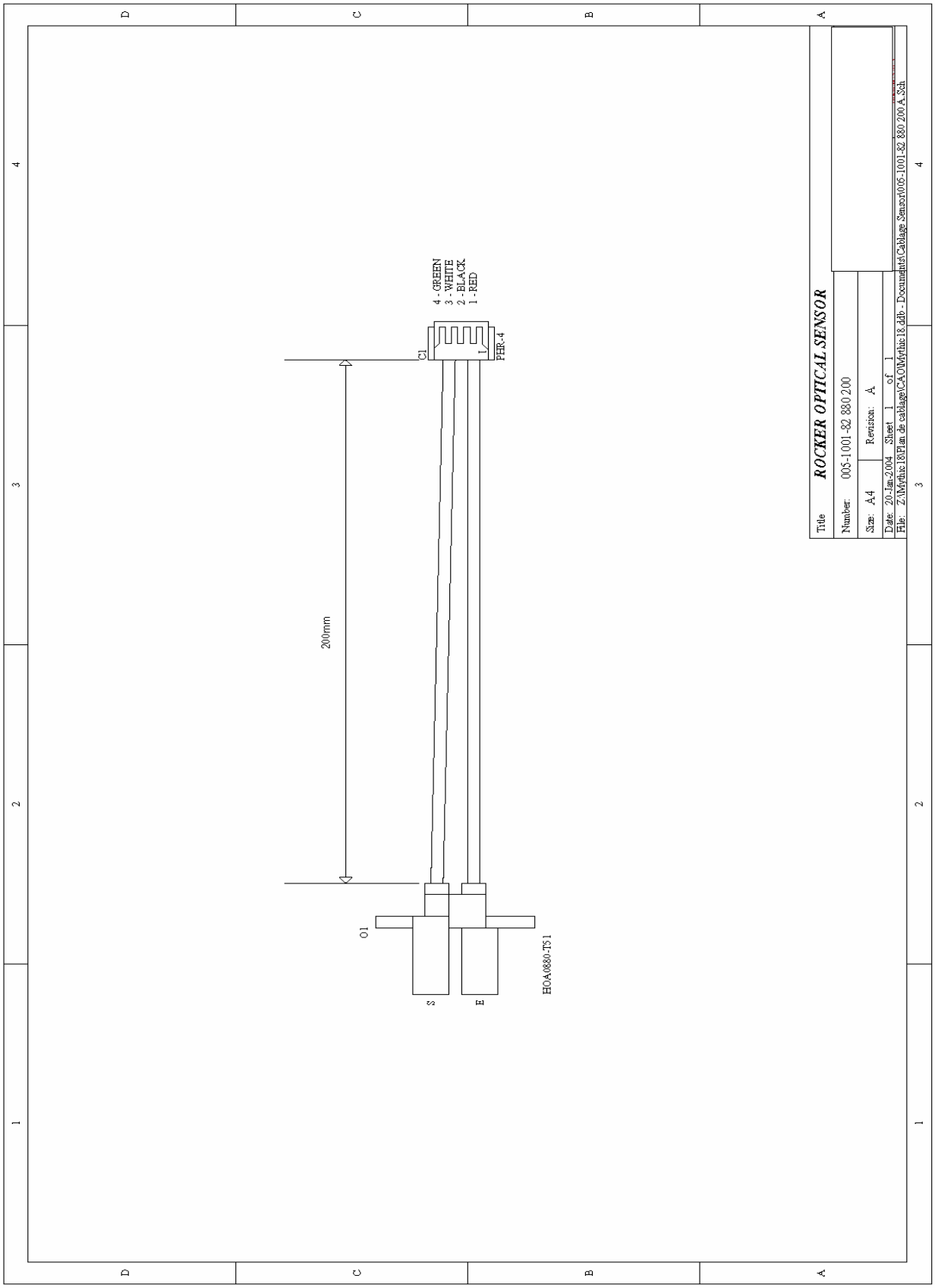
Copyright© Orphée SA. All Rights Reserved.

3.4.2 Stepper motor



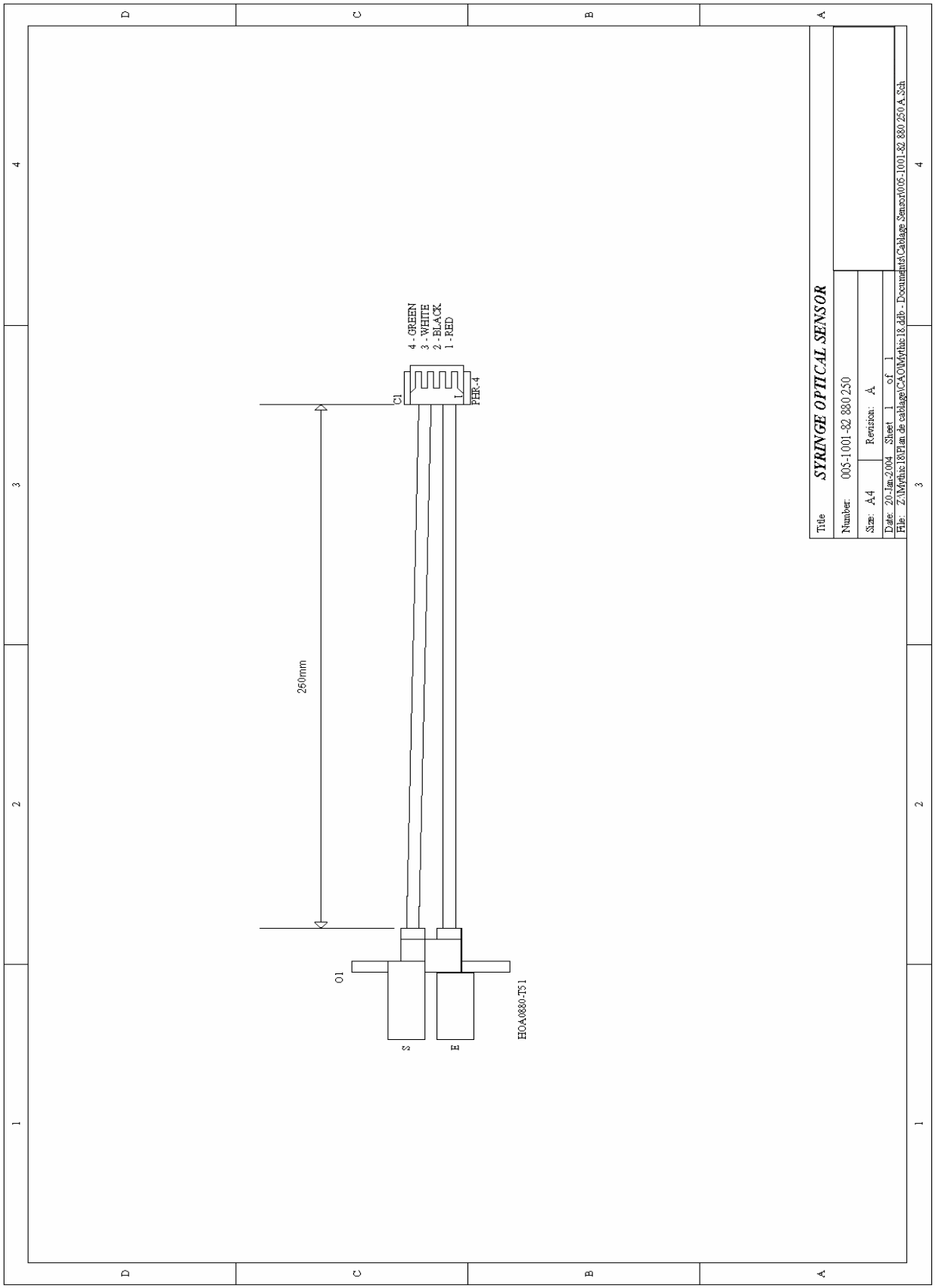
 Copyright© Orphée SA. All Rights Reserved.

3.4.3 Rocker optical sensor



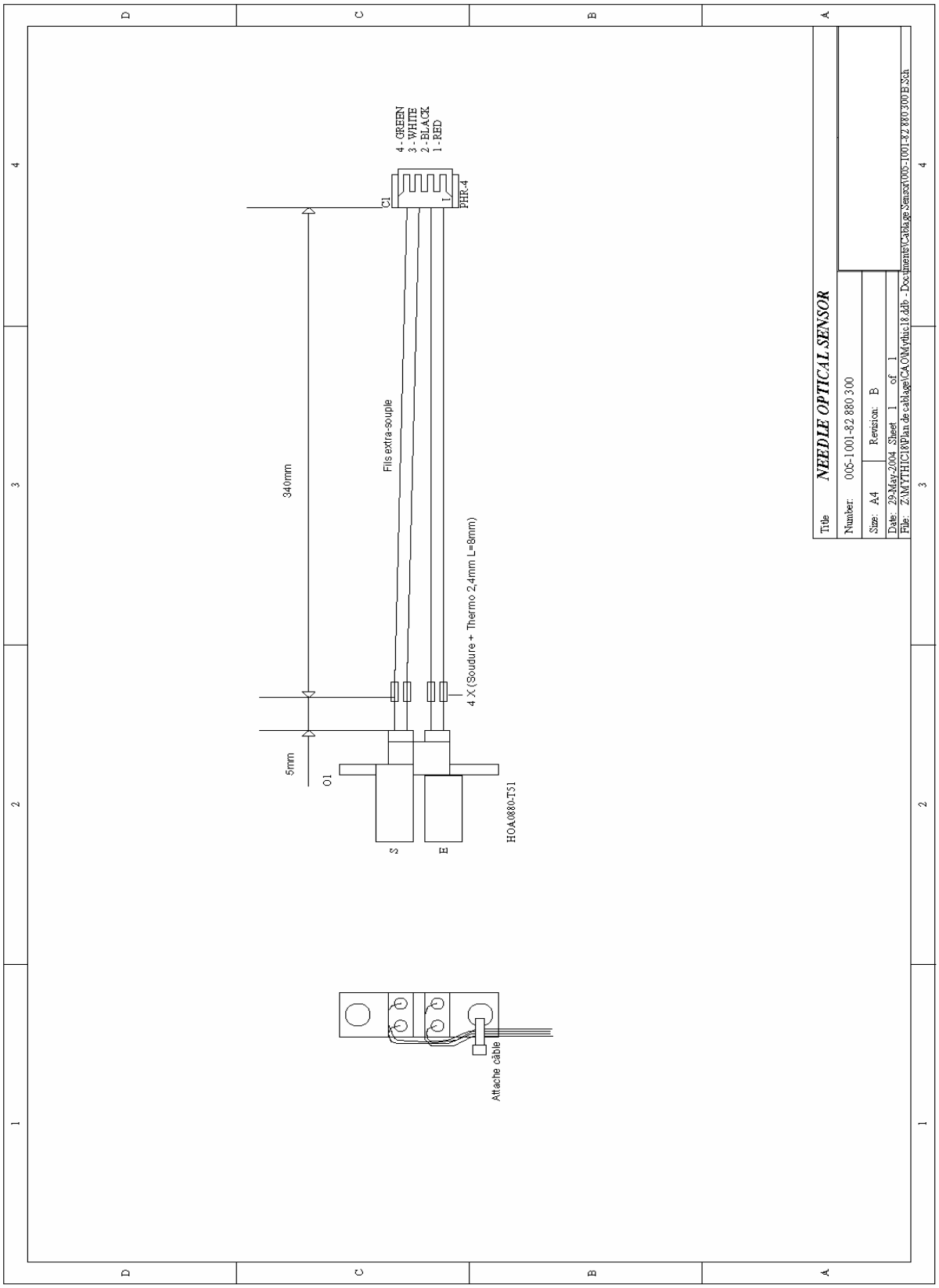
 Copyright© Orphée SA. All Rights Reserved.

3.4.4 Syringe optical sensor



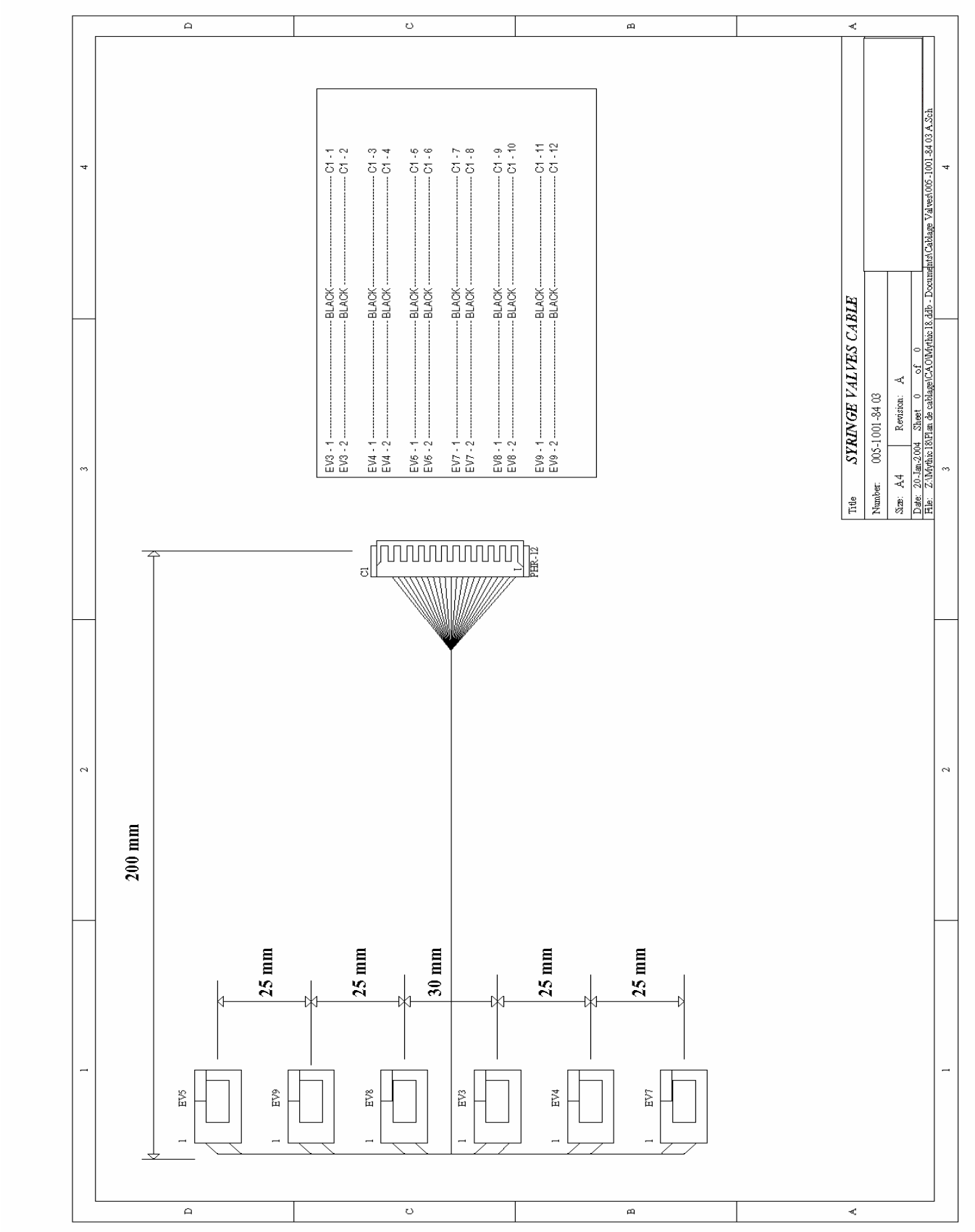
 Copyright© Orphée SA. All Rights Reserved.

3.4.5 Needle optical sensor



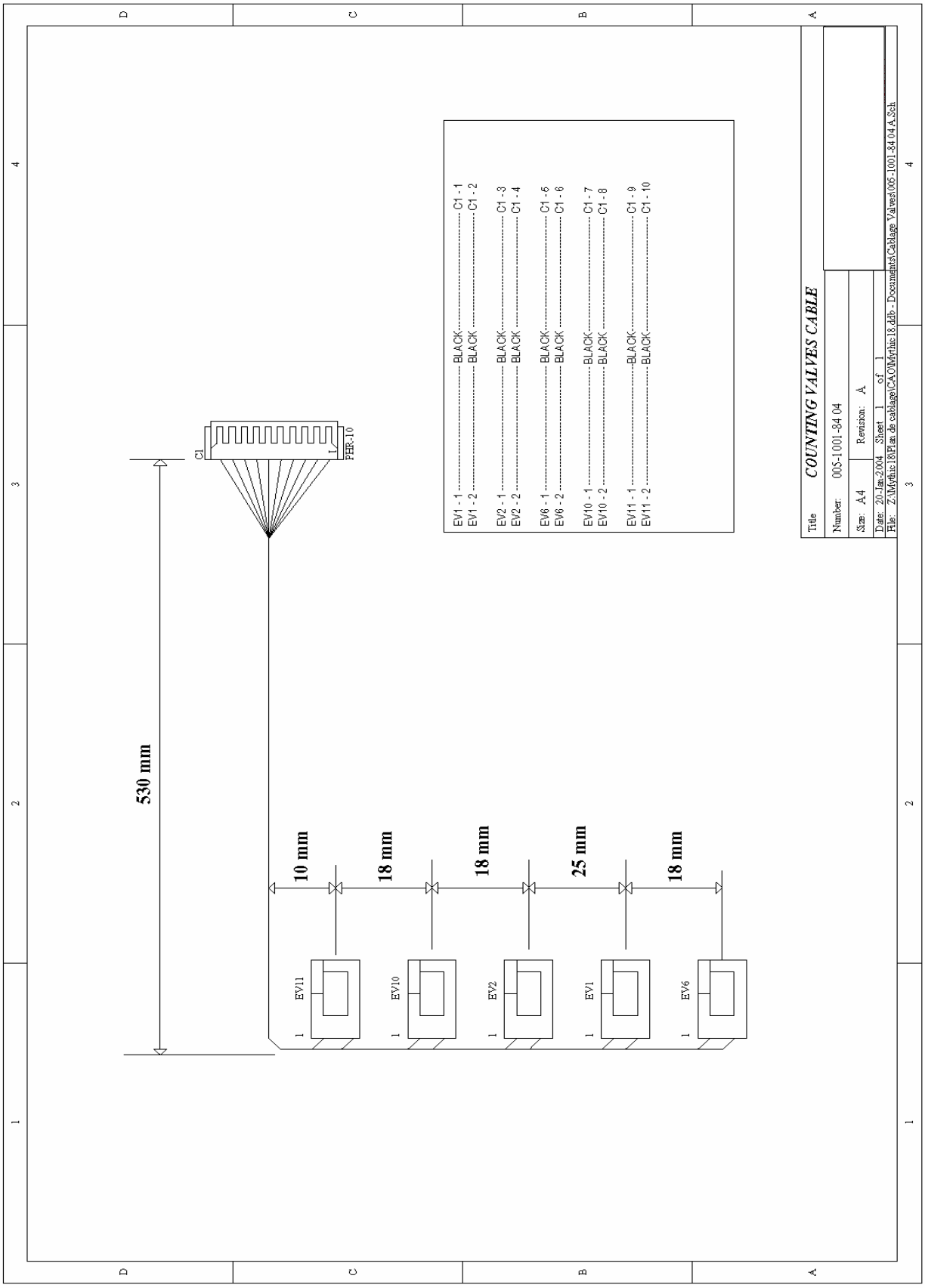
 Copyright© Orphée SA. All Rights Reserved.

3.4.6 Syringe valve cable


EV3 - 1 ---------- BLACK ---------- C1 - 1
EV3 - 2 ---------- BLACK ---------- C1 - 2
EV4 - 1 ---------- BLACK ---------- C1 - 3
EV4 - 2 ---------- BLACK ---------- C1 - 4
EV6 - 1 ---------- BLACK ---------- C1 - 5
EV6 - 2 ---------- BLACK ---------- C1 - 6
EV7 - 1 ---------- BLACK ---------- C1 - 7
EV7 - 2 ---------- BLACK ---------- C1 - 8
EV8 - 1 ---------- BLACK ---------- C1 - 9
EV8 - 2 ---------- BLACK ---------- C1 - 10
EV9 - 1 ---------- BLACK ---------- C1 - 11
EV9 - 2 ---------- BLACK ---------- C1 - 12
Title SYRINGE VALVES CABLE
Number 005-1001-84 03
Size: A4 Revision: A
Date: 20-Jan-2004 Sheet 0 of 0
File: Z:\Mythic 18\Plan de cablage\CAO\Mythic18.ddb - Documents\Cablage Valves\005-1001-84 03 A.Sch
C1
PHR-12
200 mm
25 mm
25 mm
30 mm
25 mm
25 mm
EV5
EV9
EV8
EV3
EV4
EV7

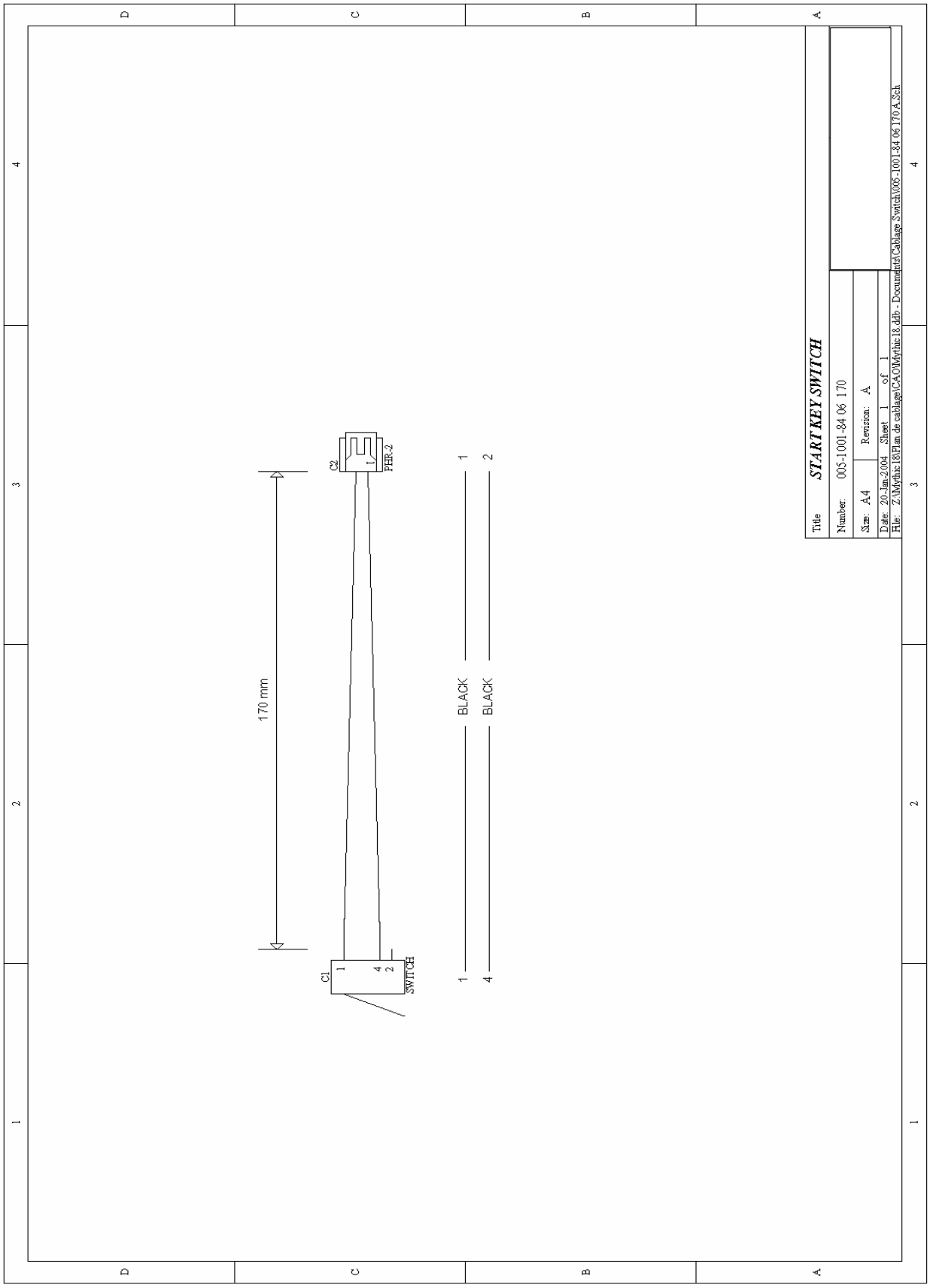
 Copyright© Orphée SA. All Rights Reserved.

3.4.7 Counting valve cable


EV1 - 1 ---------- BLACK ---------- C1 - 1
EV1 - 2 ---------- BLACK ---------- C1 - 2
EV2 - 1 ---------- BLACK ---------- C1 - 3
EV2 - 2 ---------- BLACK ---------- C1 - 4
EV6 - 1 ---------- BLACK ---------- C1 - 5
EV6 - 2 ---------- BLACK ---------- C1 - 6
EV10 - 1 ---------- BLACK ---------- C1 - 7
EV10 - 2 ---------- BLACK ---------- C1 - 8
EV11 - 1 ---------- BLACK ---------- C1 - 9
EV11 - 2 ---------- BLACK ---------- C1 - 10
C1
PHR-10
530 mm
10 mm
18 mm
18 mm
25 mm
18 mm
EV11
EV10
EV2
EV1
EV6
Title COUNTING VALVES CABLE
Number: 005-1001-84 04
Size: A4
Revision: A
Date: 20-Jan-2004 Sheet 1 of 1
File: Z:\Mythic18\Plan de cablage\CAO\Mythic18.ddb - Documents\Cablage Valves\005-1001-84 04 A.Sch

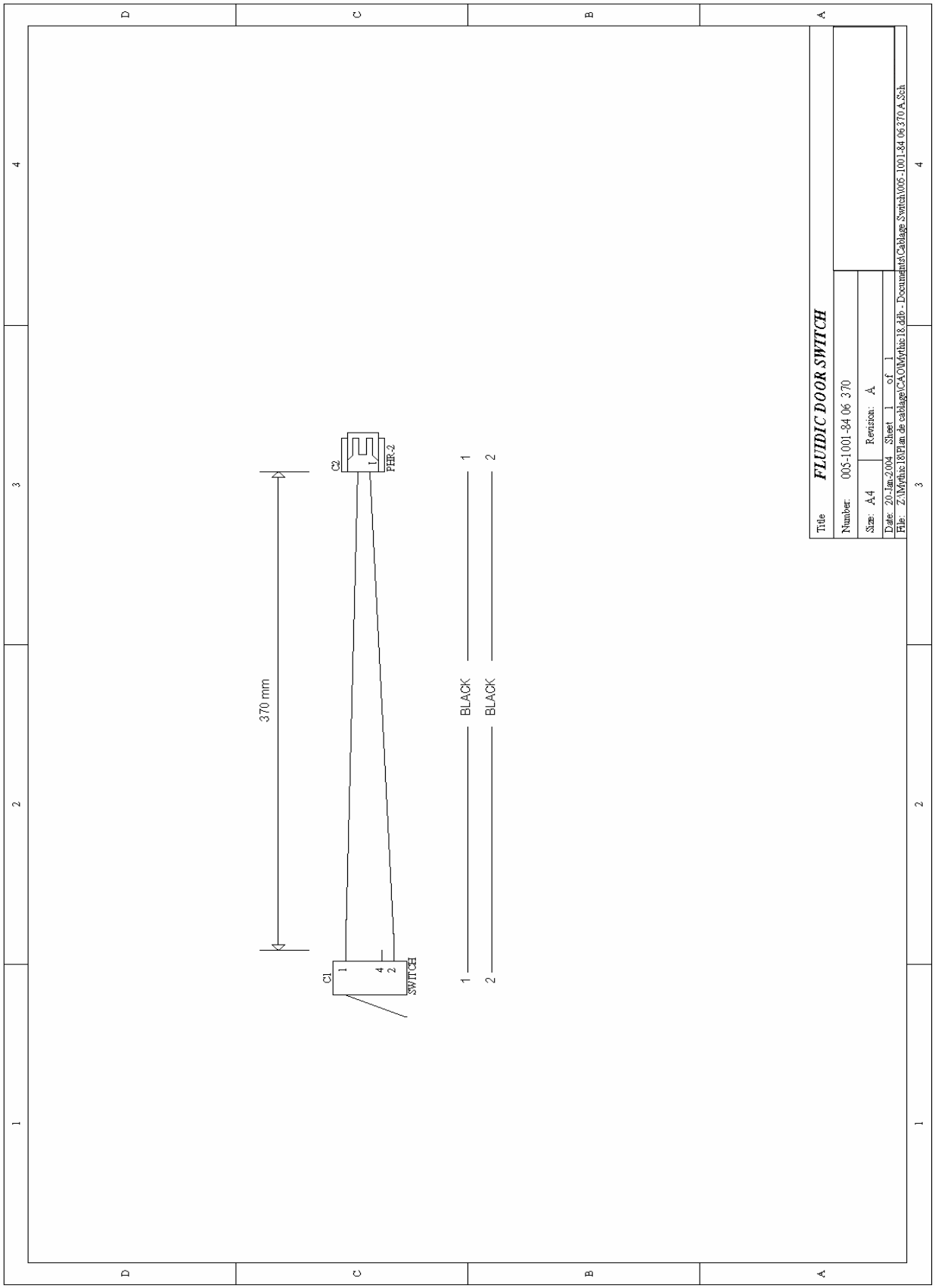
 Copyright© Orphée SA. All Rights Reserved.

3.4.8 Start key switch



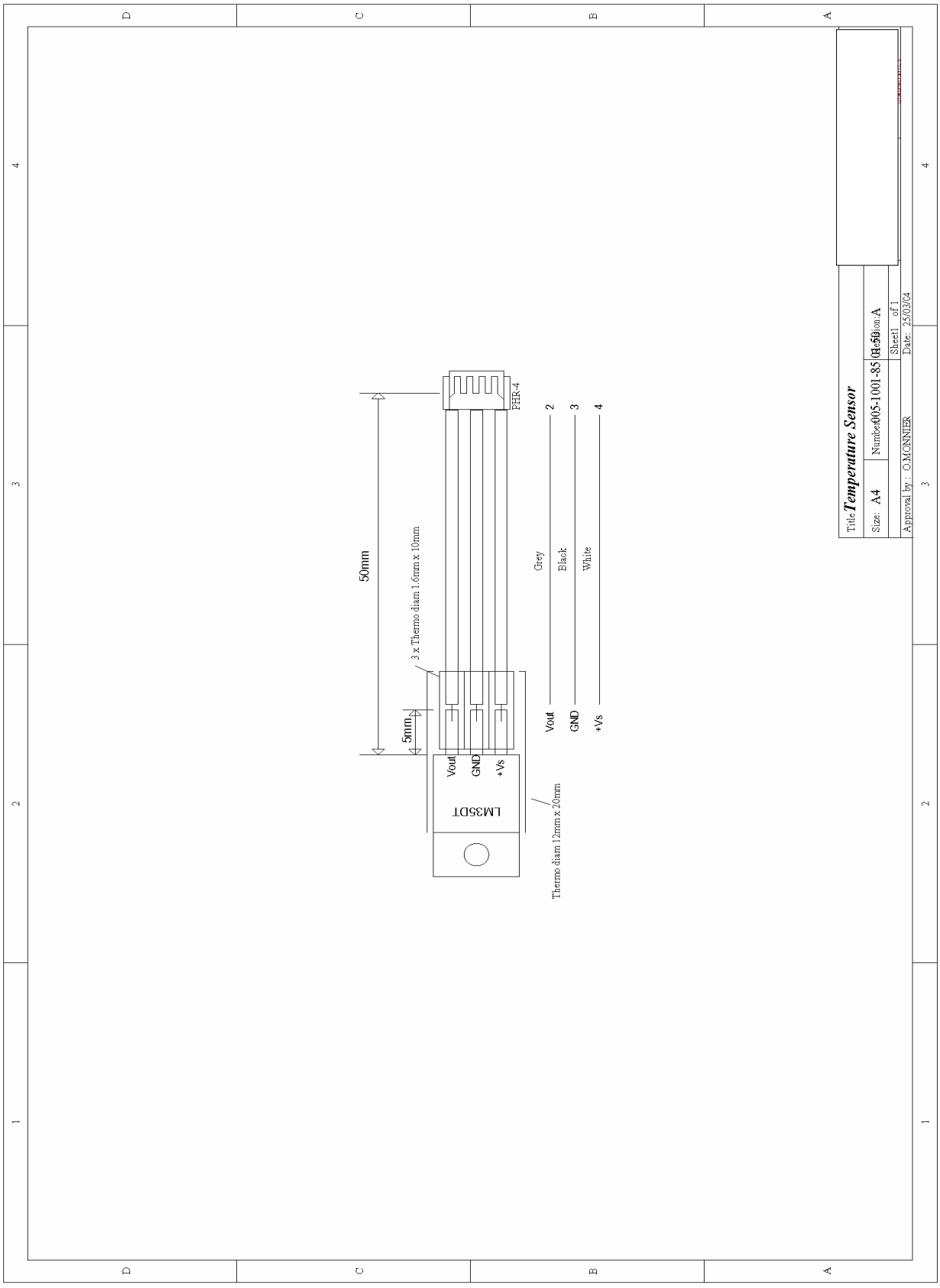
 Copyright© Orphée SA. All Rights Reserved.

3.4.9 Fluidic door switch



 Copyright© Orphée SA. All Rights Reserved.

3.4.10 Temperature sensor



 Copyright© Orphée SA. All Rights Reserved.

4. SPECIFICATIONS

4.1 ANALYTICAL SPECIFICATIONS

Refer to the User Manual.

4.2 REAGENTS SPECIFICATIONS

Refer to the User Manual.

4.3 LIMITATIONS

Refer to the User Manual.

Copyright© Orphée SA. All Rights Reserved.

5. OUTPUT FORMAT

The choice of the setting (format, speed …) is explained in page N° 24 of the User's Manual.

5.2 C2 FORMAT

5.2.1 General principle

Mythic begins frame with headline
MYTHIC X ;Y ;Z(;eventual parameters)[CR]
Where :

X is the number of the Mythic (maximum 2 characters).
Y is the user identification (login) (maximum 10 characters).
Z frame identification.

The decimal separator is the dot (.).
The field separator is « ; ».
The line separator and the indicator of end is CR.
The uncut frame are :

Request of results send with send results.
Send calibration pack with results of calibration.

All the lines of a frame must be sent. (If no information, the parameter is not fulfilled).
All the identifiant (frame or parameters) are in block letters.
All editable text field (Identification, lot) are coded in UTF8 (non Latin languages management).

5.2.2 FRAMES

5.2.2.1 REQUEST TO SEND RESULTS

Mythic sends results after acknowledgement by the host.
Frames used in « Hand-Shake » mode.

5.2.2.1.1 Request to send results

MYTHIC X ;Y ;RESULT_READY ;Size[CR]

5.2.2.1.2 ACKNOWLEDGEMENT REQUEST TO SEND RESULTS

ACK_RESULT_READY[CR]

5.2.2.1.3 ACKNOWLEDGEMENT RESULTS

ACK_RESULT;A;B[CR]
Where A : OK or Error Code, B : Reserved.

 Copyright© Orphée SA. All Rights Reserved.

5.2.2.2 ROUTINE RESULTS

MYTHIC X ;Y ;RESULT [CR]
DATE;jj/mm/aaaa [CR]
TIME;hh:mm:ss [CR]
MODE;NORMAL [CR]
UNIT ; Unité [CR] (0, 1 ou 2)
SEQ;Sequence number; 0 [CR]
SID;Sample Identification [CR]
PID;Patient Identification [CR]
ID;Identification [CR]
TYPE; Blood Type [CR]
TEST; Run Test [CR]
OPERATOR ; login Mythic when analysis is performed [CR]
WBC; Value;A;B; low panic; low normal; high normal; High panic [CR]
RBC; Value;A;B; low panic; low normal; high normal; High panic [CR]
HGB; Value;A;B; low panic; low normal; high normal; High panic [CR]
HCT; Value;A;B; low panic; low normal; high normal; High panic [CR]
MCV; Value;A;B; low panic; low normal; high normal; High panic [CR]
MCH; Value;A;B; low panic; low normal; high normal; High panic [CR]
MCHC; Value;A;B; low panic; low normal; high normal; High panic [CR]
RDW; Value;A;B; low panic; low normal; high normal; High panic [CR]
PLT; Value;A;B; low panic; low normal; high normal; High panic [CR]
MPV; Value;A;B; low panic; low normal; high normal; High panic [CR]
THT; Value;A;B; low panic; low normal; high normal; High panic [CR]
PDW; Value;A;B; low panic; low normal; high normal; High panic [CR]
LYM%; Value;A;B; low panic; low normal; high normal; High panic [CR]
MON%; Value;A;B; low panic; low normal; high normal; High panic [CR]
GRA%; Value;A;B; low panic; low normal; high normal; High panic [CR]
LYM; Value;A;B; low panic; low normal; high normal; High panic [CR]
MON; Value;A;B; low panic; low normal; high normal; High panic [CR]
GRA; Value;A;B; low panic; low normal; high normal; High panic [CR]
WBC CURVE; Channel value1;… ; Channel value 128 [CR]
WBC THRESHOLDS;S1;S2;S3 [CR]
RBC CURVE; Channel value1;… ; Channel value 128 [CR]
RBC THRESHOLDS; S1;S2 [CR]
PLT CURVE; Channel value1;… ; Channel value 128 [CR]
PLT THRESHOLDS; S1 [CR]
ALARMS;x;x;x;x;x;x;x;x;x;x;x [CR]
INTERPRETIVE_WBC;y;y;y;y;y;y;y;y;y;y;y;y [CR]
INTERPRETIVE_RBC;y;y;y;y;y;y;y;y;y;y;y;y [CR]
INTERPRETIVE_PLT;y;y;y;y;y;y;y;y;y;y;y;y [CR]
COMMENT; RUO message if necessary
END_RESULT; Checksum value [CR]

 Copyright© Orphée SA. All Rights Reserved.

A : None or * (Rejection flag)
B : None or D or H or h or l or L (Out of limit flags)
x : None or Alarm.
y : None or pathologic message.
S1 S2 S3 : thresholds of the curves (Between 0 and 127).
This frame is available for LMG test.
Numeric values should be replaced by +++++ (5 plus) for a out of range result or by ….. (5 dots) donor invalid results.
If RUO mode is not activated, PCT and PDW are not transmitted.

5.2.2.2.1 Alarm list.

S-UP NOT DONE
S-UP FAIL
QC NOT DONE
QC FAIL
INS-M
INS-T
INS-P
INS-R
INS-H
L1
L2
L3
L4
L5
R1
R2
P1
P2
P3

5.2.2.2.2 WBC pathologic alarms

LEU>
LEU<
LYM>
LYM<
GRA>
GRA<
MON>
NO_INTERPRETATION

 Copyright© Orphée SA. All Rights Reserved.

5.2.2.2.3 RBC pathologic messages

ANE
ERY>
MICRO
MACRO
MICR>
MICR>>
MICR>>>
MACR>
MACR>>
MACR>>>
ANIS>
ANIS>>
ANIS>>>
HYPOCR
COLDAGG
NO_INTERPRETATION

5.2.2.2.4 PLT pathologic messages

THR>
THR<
MACROP
PLTAGGR
MICROC
SCHIZ
CELLD
NO_INTERPRETATION

5.2.2.3 CALIBRATION

MYTHIC X;Y;CALIBRATION;Y ;Calibration date ;calibration time ;LOT ;Expiry date ;Creation date ;Creation time ; ;X ;A ;B ;C ;D ;F ;Number of results [CR]
WBC; target value ; tolerance [CR]
RBC; target value ; tolerance [CR]
HGB; target value ; tolerance [CR]
HCT; target value ; tolerance [CR]
PLT; target value ; tolerance [CR]
END_CALI ; Checksum [CR]
Where
X : User who creates the lot.
Y : User who performs the calibration.
A, B, C, D and F are the coefficient of the calibration, for respectively, WBC, RBC, HGB, HCT and PLT.
Follow N results which served for calibration.
In case of manual input of the coefficients, information of the lot are empty and the number of results is null.
Acknowledgement of the calibration is done by the frame
ACK_CALI ;Lot;A [CR]
Where A : OK or Error Code.

 Copyright© Orphée SA. All Rights Reserved.

5.2.2.3.1 Results

MYTHIC X ;Y ;RESULT [CR]
DATE;dd/mm/yyyy [CR]
TIME;hh:mm:ss [CR]
MODE;CALIBRATION [CR]
UNIT ; Unit [CR]
SEQ;Number of sequence; 0 [CR]
TEST;LMG [CR]
OPERATOR ; login Mythic when analysis is performed [CR]
WBC; Numerical Value; A;B;;;; [CR]
RBC; Numerical Value; A;B;;;; [CR]
HGB; Numerical Value; A;B;;;; [CR]
HCT; Numerical Value; A;B;;;; [CR]
PLT; Numerical Value; A;B;;;; [CR]
END_RESULT; Checksum value [CR]

A and B like routine results.

5.2.2.4 QC

5.2.2.4.1 Results

MYTHIC X ;Y ;RESULT [CR]
DATE;dd/mm/yyyy [CR]
TIME;hh:mm:ss [CR]
MODE;QC [CR]
UNIT ; Unit [CR]
SEQ;Number of sequence; 0 [CR]
LOT, Number of lot [CR] (Maximum 10 characters)
LOT DATE; Creation Dateof the lot ; time of creation [CR]
EXPIRY DATE; Expiry date [CR]
USER; User (login) who created the lot [CR]
TEST;LMG [CR]
OPERATOR ; login Mythic when analysis is performed [CR]
WBC; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
RBC; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
HGB; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
HCT; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
MCV; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
MCH; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
MCHC; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
RDW; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
PLT; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
MPV; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
THT; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
PDW; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
LYM%; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
MON%; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
GRA%; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
LYM; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
MON; Value;A;B; Target - tolerance;;; Target + tolerance [CR]

 Copyright© Orphée SA. All Rights Reserved.

GRA; Value;A;B; Target - tolerance;;; Target + tolerance [CR]
END_RESULT; Cheksum value [CR]
A and B like routine results.

5.2.2.5 REPEATABILITY

5.2.2.5.1 Results

MYTHIC X ;Y ;RESULT [CR]
DATE;dd/mm/yyyy [CR]
TIME;hh:mm:ss [CR]
MODE;REPEATABILITY [CR]
UNIT ; Unit [CR]
SEQ;Number of sequence; 0 [CR]
TEST;LMG [CR]
OPERATOR ; login Mythic when analysis is performed [CR]
WBC; Value;A;B;;;; [CR]
RBC; Value; A;B;;;; [CR]
HGB; Value; A;B;;;; [CR]
HCT; Value; A;B;;;; [CR]
MCV; Value; A;B;;;; [CR]
MCH; Value; A;B;;;; [CR]
MCHC; Value; A;B;;;; [CR]
RDW; Value; A;B;;;; [CR]
PLT; Value; A;B;;;; [CR]
MPV; Value; A;B;;;; [CR]
THT; Value; A;B;;;; [CR]
PDW; Value; A;B;;;; [CR]
LYM%; Value; A;B;;;; [CR]
MON%; Value; A;B;;;; [CR]
GRA%; Value; A;B;;;; [CR]
LYM; Value; A;B;;;; [CR]
MON; Value; A;B;;;; [CR]
GRA; Value; A;B;;;; [CR]
END_RESULT; Checksum value [CR]

A and B like routine results.

5.2.3 CHECKSUM

For the frames with a few number of lines, the block is finished with an end line with a checksum. This sum is calculated from the beginning of the headline to the end of the line finishing the block.
The algorithm of the calculation for the sum is :

CRC = 0xFFFF
For each byte
    Work on high neeble:
    Indix = byte XOR CRC
    Indix = Indix AND 000F
    CRC = Table(Indix) XOR (CRC divided by 16)
    Work on low neeble:

 Copyright© Orphée SA. All Rights Reserved.

Indix = byte divided by 16
Indix = Indix XOR CRC
Indix = Indix AND 000F
CRC = Table(Indix) XOR (CRC divided by 16)

Example in C language:

```
/*Hash table :*/
static const unsigned short ausCrcTab1[] =
 {
 0x0000, 0xCC01,0xD801,0x1400,0xF001,0x3C00,0x2800,0xE401,
 0xA001,0x6C00,0x7800,0xB401,0x5000,0x9C01,0x8801,0x4400,
};

/* CRC computing */

unsigned short calc_crc(unsigned char *pucData, long lSize)
{
unsigned short usAcc1 = 0xFFFF;

 while ( lSize > 0 )
        {
        /* gestion par quartet du calcul  */
        usAcc1 = ausCrcTab1[(*pucData ^ usAcc1) & 15] ^ (usAcc1 >> 4);
        usAcc1 = ausCrcTab1[((*pucData >> 4) ^ usAcc1) & 15] ^ (usAcc1 >> 4);

        pucData++;
        lSize--;
        }

return(usAcc1);
}
```

^ : XOR.
>> : Logical shift right.
& : logical AND.

 Copyright© Orphée SA. All Rights Reserved.

6. PARTS LIST & BLOW UP VIEW

6.1 PARTS LIST

6.1.2 Two years spare parts kit

Part Number : 002-1001-50 20 02
Designation : Mythic 18 (2 years) spare parts kit

QTY	Rev	Part Number	Designation
2	A	002-1001-50 10	Mythic 18 O-Rings kit
1	A	002-1001-50 11	Mythic 18 Tubings kit
2	A	005-1001-03 03	Piston Ø 22
1	A	010-2501-02 05	Sampling needle
1	A	010-2501-03 01	Piston Ø 6.5 - Syringes module
1	A	010-2501-03 02	Piston Ø 16 - Syringes module

6.1.2 Maintenance kit

Part Number : 002-1001-50 02
Designation : Mythic 18 Maintenance Kit

QTY	Rev	Part Number	Designation
1	A	005-1001-90 016 032	Tygon tubing L=1000mm 1.6x3.2mm
1	A	005-1001-90 020 040	Tygon tubing L=500mm 2x4mm
1	B	005-1001-90 09	Tubing 9
1	B	005-1001-90 10	Tubing 10
4	A	010-2501-06 03	Bottle cap filter
5		153-0101-100 25	Cables Ties
2		312-0505-1310 160	O-ring Ø13.1x1.6 Fluocarbon 80SH
1		312-0505-140 125 010	O-ring Ø1.4x1.25 Fluocarbon 80SH
2		312-0505-500 100	O-ring Ø5x1 Fluocarbon 80SH
0,05		410-0501-01	Silicon M1011 grease
1		700-1101-10	Short Arm TORX T10 Tool
1		700-1101-20	Short Arm TORX T20 Tool

Copyright© Orphée SA. All Rights Reserved.

6.1.2 O-rings kit

Part Number : 002-1001-50 10
Designation : Mythic 18 O-Rings kit

QTY	Rev	Part Number	Designation
1		312-0501-1554 262	O-ring Ø15.54x2.62 Silicone 60SH
1		312-0501-1877 178	O-ring Ø18.77x1.78 Silicone 60SH
2		312-0501-2189 262	O-ring Ø21.89x2.62 Silicone 60SH
1		312-0501-4734 178	O-ring Ø47.34x1.78 Silicone 60SH
1		312-0501-630 240	O-ring Ø6.3x2.4 Silicone 60SH
1		312-0501-635 178	O-ring Ø6.35x1.78 Silicone 60SH
1		312-0501-952 178	O-ring Ø9.52x1.78 Silicone 60SH
2		312-0505-1310 160	O-ring Ø13.1x1.6 Fluocarbon 80SH
3		312-0505-140 125 010	O-ring Ø1.4x1.25 Fluocarbon 80SH
2		312-0505-500 100	O-ring Ø5x1 Fluocarbon 80SH

6.1.2 Tubing kit

Part Number : 002-1001-50 11
Designation : Mythic 18 Tubing kit

QTY	Rev	Part Number	Designation
1	A	005-1001-90 01	Tubing 1
1	A	005-1001-90 02	Tubing 2
1	A	005-1001-90 03	Tubing 3
1	A	005-1001-90 04	Tubing 4
1	A	005-1001-90 05	Tubing 5
1	A	005-1001-90 06	Tubing 6
1	B	005-1001-90 07	Tubing 7
1	A	005-1001-90 08	Tubing 8
1	B	005-1001-90 09	Tubing 9
1	B	005-1001-90 10	Tubing 10
1	A	005-1001-90 11	Tubing 11
1	A	005-1001-90 12	Tubing 12
1	A	005-1001-90 13	Tubing 13
1	B	005-1001-90 14	Tubing 14
1	A	005-1001-90 15	Tubing 15
1	A	005-1001-90 16	Tubing 16
1	A	005-1001-90 17	Tubing 17
1	A	005-1001-90 18	Tubing 18
1	A	005-1001-90 19	Tubing 19
1	A	005-1001-90 20	Tubing 20
1	B	005-1001-90 21	Tubing 21
1	A	005-1001-90 22	Tubing 22
1	B	005-1001-90 23	Tubing 23 - DILUENT
1	B	005-1001-90 24	Tubing 24 - WASTE
1	A	005-1001-90 25	Tubing 25

Copyright© Orphée SA. All Rights Reserved.

6.1.2 All spare parts

Mythic 18 Spare Parts Rev 3			
Designation	**Part Number**	**Qty/Pkg**	**Unit**
1L Straw	005-1001-06 01	1	UNIT
40P Flexible Flat Cable	170-4001-05 210	1	UNIT
5/10-20L Adaptator	300-1009-05 1020	1	UNIT
70W switching adapter	050-1001-01 70 24	1	UNIT
Bottle cap filter	010-2501-06 03	10	UNIT
Counting Chambers	005-1001-01 01	1	UNIT
Counting Manifold	010-2501-01 03	1	UNIT
Counting Valves Cable	005-1001-84 04	1	UNIT
Electrovalve 2/2	309-0501-152401	1	UNIT
Electrovalve 3/2	309-0501-152402	1	UNIT
Electrovalve 3/2 - 1.6mm	309-0501-01 016	1	UNIT
Fluidic Door Switch	002-1001-84 06 370	1	UNIT
Front cover	005-1001-04 02	1	UNIT
Lubriplate DS-ES	410-0502-01	1	UNIT
Lyse Spring	005-1001-86 01	1	UNIT
Mythic 18 (2 years) spare part kit	002-1001-50 20 02	1	UNIT
Mythic 18 CPU Board	205-1001-01	1	UNIT
Mythic 18 CPU Board & Preamplifier	002-2001-04	1	UNIT
Mythic 18 IHM Board	205-1001-02	1	UNIT
Mythic 18 Maintenance Kit	002-1001-50 02	1	UNIT
Mythic 18 O-Rings kit	002-1001-50 10	1	UNIT
Mythic 18 Preampifier Board	205-1001-03	1	UNIT
Mythic 18 Tubings kit	002-1001-50 11	1	UNIT
Needle Belt	353-0301-08 120 19	1	UNIT
Needle carriage	010-2501-02 02	1	UNIT
Needle Motor	005-1001-02 02	1	UNIT
Needle Optical Sensor	005-1001-82 880 300	1	UNIT
O-ring Ø1.07x1.27 Fluocarbon 80SH	312-0505-107 127	10	UNIT
O-ring Ø1.4x1.25 Fluocarbon 80SH	312-0505-140 125 010	10	UNIT
O-ring Ø13.1x1.6 Fluocarbon 80SH	312-0505-1310 160	10	UNIT
O-ring Ø15.54x2.62 Silicone 60SH	312-0501-1554 262	10	UNIT
O-ring Ø18.77x1.78 Silicone 60SH	312-0501-1877 178	10	UNIT
O-ring Ø21.89x2.62 Silicone 60SH	312-0501-2189 262	10	UNIT
O-ring Ø47.34x1.78 Silicone 60SH	312-0501-4734 178	10	UNIT
O-ring Ø5x1 Fluocarbon 80SH	312-0505-500 100	10	UNIT
O-ring Ø6.35x1.78 Silicone 60SH	312-0501-635 178	10	UNIT
O-ring Ø6.3x2.4 Silicone 60SH	312-0501-630 240	10	UNIT
O-ring Ø9.52x1.78 Silicone 60SH	312-0501-952 178	10	UNIT
O-Ring spacer	010-2501-03 10	1	UNIT

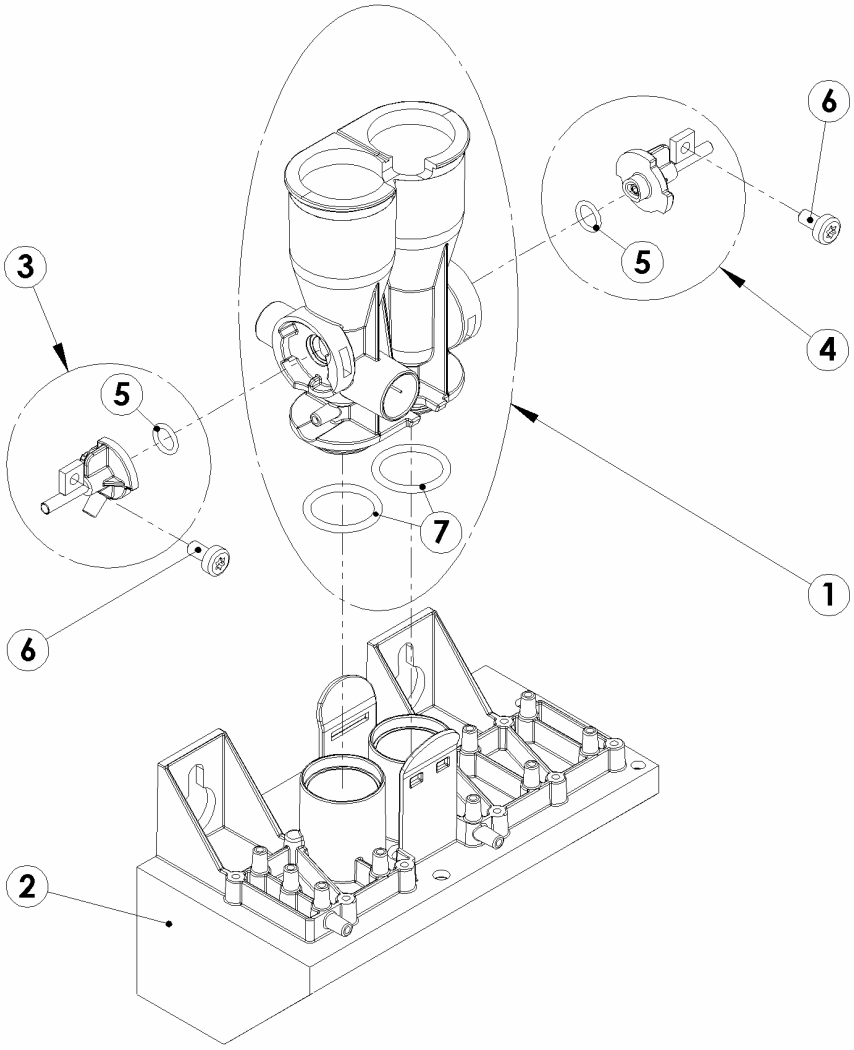
 Copyright© Orphée SA. All Rights Reserved.

Designation	Part Number	Qty/Pkg	Unit
Piston Carriage	010-2501-03 08	1	UNIT
Piston Ø 16	010-2501-03 02	1	UNIT
Piston Ø 22	005-1001-03 03	1	UNIT
Piston Ø 6.5	010-2501-03 01	1	UNIT
Plastic grease SPG35	410-0503-01	1	UNIT
RBC Counting Head	005-1001-01 02 02	1	UNIT
Rinsing head	005-1001-02 04	1	UNIT
Rocker Motor	005-1001-02 03	1	UNIT
Rocker Optical Sensor	005-1001-82 880 200	1	UNIT
Sampling module	005-1001-02 01	1	UNIT
Sampling needle	010-2501-02 05	1	UNIT
Screw CBLX M2 x 10	360-0103-020 100	10	UNIT
Screw CZX M3 x 6	360-0101-030 060	10	UNIT
Screw CZX M3 x 8	360-0101-030 080	10	UNIT
Screw CZX M4 x 20	360-0101-040 200	10	UNIT
Screw CZX M4 x 6	360-0101-040 060	10	UNIT
Screw K 30 x 10	363-0201-030 100	10	UNIT
Screw K 30 x 8	363-0201-030 080	10	UNIT
Screw K 40 x 10	363-0201-040 100	10	UNIT
Screw RLX M3 x 6	360-0102-030 060	10	UNIT
Screw RLX M4 x 8	360-0102-040 080	10	UNIT
Seal plate	010-2501-03 06	1	UNIT
Short Arm TORX T10 Tool	700-1101-10	1	UNIT
Short Arm TORX T20 Tool	700-1101-20	1	UNIT
Silent bloc M4	385-1001-04 30	4	UNIT
Start key Switch	005-1001-84 06 170	1	UNIT
Stepper motor cable	005-1001-80 01 220	1	UNIT
Syringe Body	002-1001-03 05	1	UNIT
Syringe Motor	005-1001-03 10	1	UNIT
Syringe Motor Holder	005-1001-03 07	1	UNIT
Syringe Optical Sensor	005-1001-82 880 250	1	UNIT
Syringe Piston Ø 1.6	005-1001-03 09	1	UNIT
Syringe Valves Cable	005-1001-84 03	1	UNIT
Temperature Sensor	005-1001-85 01 50	1	UNIT
Tubing 23 - DILUENT	005-1001-90 23	1	UNIT
Tubing 24 - WASTE	005-1001-90 24	1	UNIT
Tubing Ground Cable	005-1001-84 07 150	1	UNIT
Tygon tubing 0,8x2,4mm	300-0502-008 024	1000	mm
Tygon tubing 1,3x3mm	300-0502-013 030	1000	mm
Tygon tubing 1,6x3,2mm	300-0502-016 032	5000	mm
Tygon tubing 2x4mm	300-0502-020 040	5000	mm
WBC Counting Head	005-1001-01 02 01	1	UNIT

Copyright© Orphée SA. All Rights Reserved.

6.2 BLOW UP VIEW

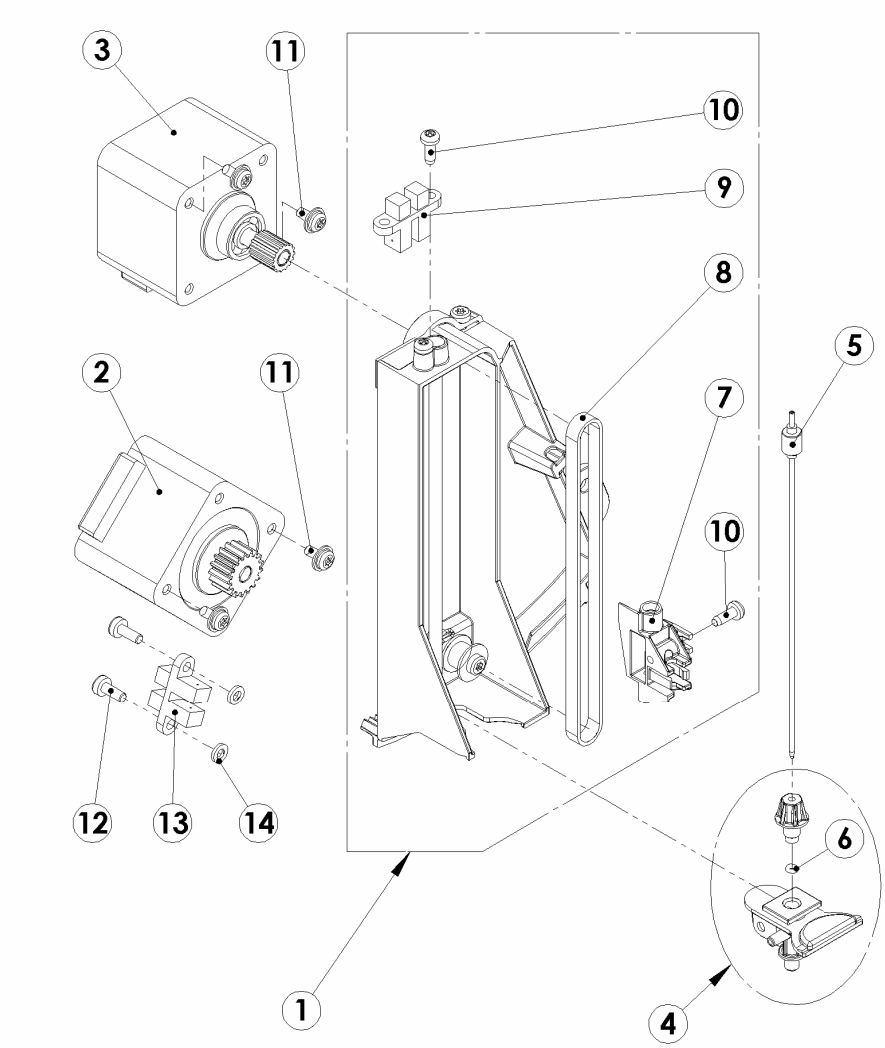
6.2.1 Counting Module



Rep	Part Number	Designation
1	005-1001-01 01	Counting chambers
2	010-2501-01 03	Counting manifold
3	005-1001-01 02 01	WBC Counting Head
4	005-1001-01 02 02	RBC Counting Head
5	312-0505-500 100	O-ring Ø5x1 Silicone 80SH
6	360-0101-030 060	Screw CZX M3 x 6
7	312-0505-1310 160	O-ring Ø13.1x1.6 Fluocarbon 80SH

 Copyright© Orphée SA. All Rights Reserved.

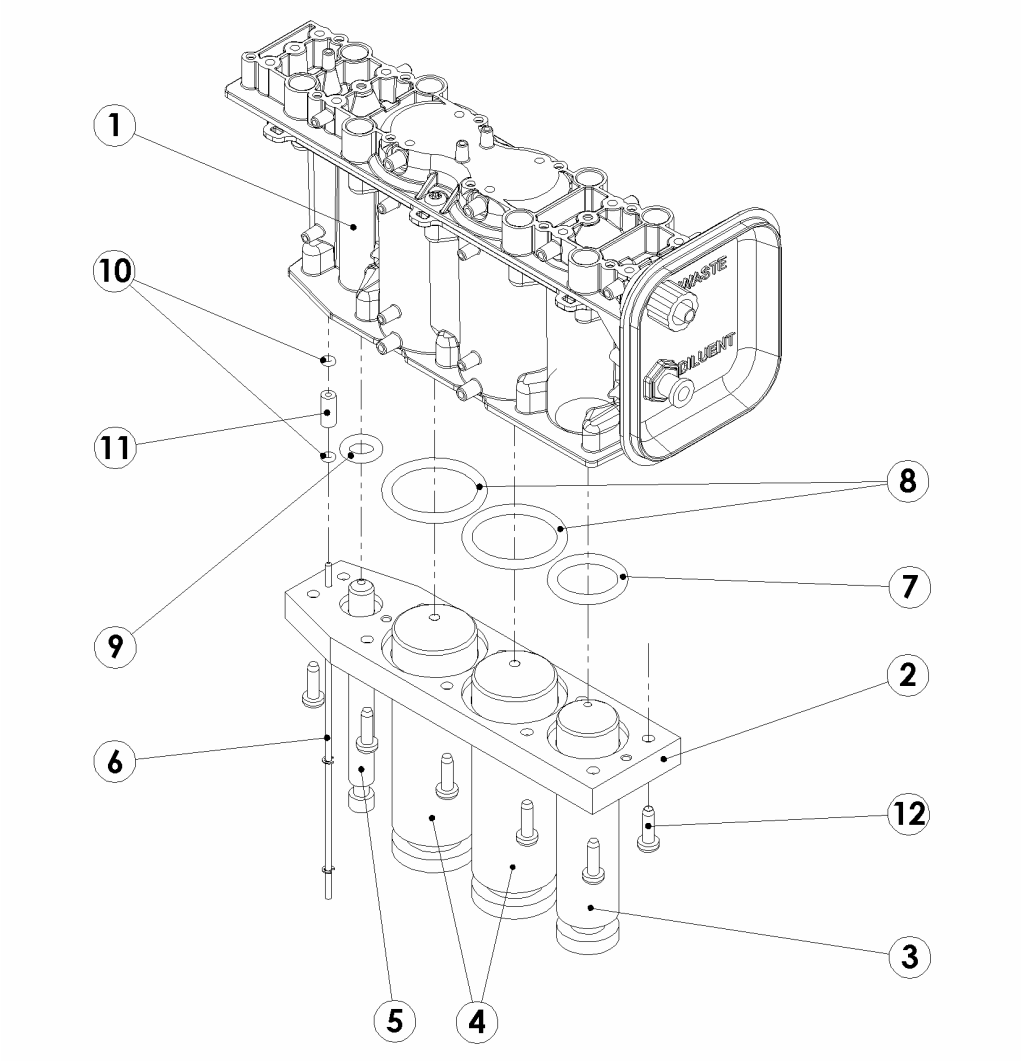
6.2.2 Sampling Module



Rep	Part Number	Designation
1	005-1001-02 01	Sampling module
2	005-1001-02 03	Rocker Motor
3	005-1001-02 02	Needle Motor
4	005-1001-02 04	Rinsing head
5	010-2501-02 05	Sampling Needle
6	312-0505-140 125	O-ring Ø1.4x1.25 Fluocarbon 80SH
7	010-2501-02 02	Needle carriage
8	353-0301-08 120 19	Belt pitch 2.032 (l=4.763-L=243.84)
9	005-1001-82 880 300	Needle Optical Sensor
10	363-0201-030 080	Screw K 30 x 8
11	360-0102-030 060	Screw RLX M3 x 6
12	360-0101-030 080	Screw CZX M3 x 8
13	005-1001-82 880 200	Rocker Optical Sensor
14	370-4050-030 10	Anti-loss washer Ø3 x 1

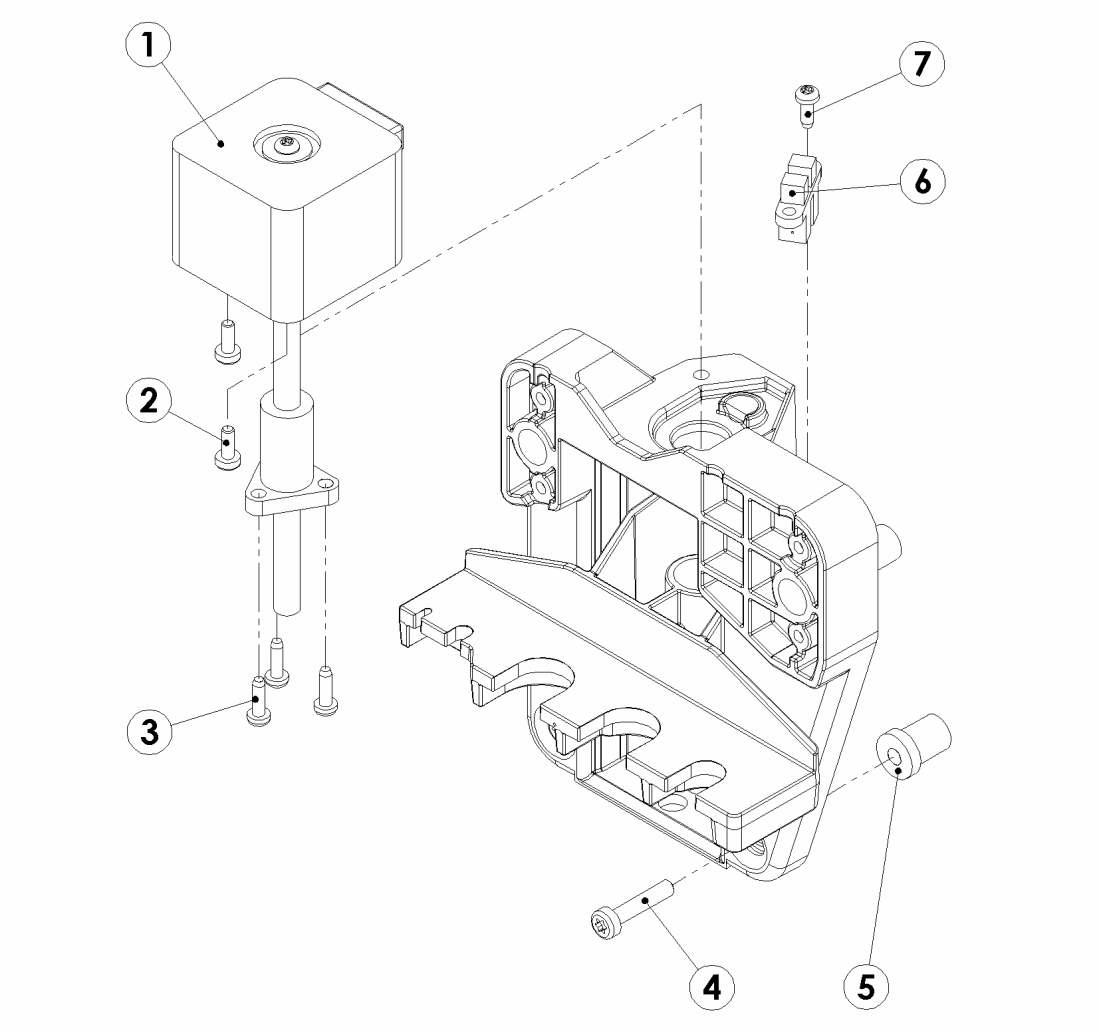
Copyright© Orphée SA. All Rights Reserved.

6.2.3 Syringe Module



Rep	Part Number	Designation
1	002-1001-03 05	Syringes body
2	010-2501-03 06	Seal plate
3	010-2501-03 02	Piston Ø 16
4	005-1001-03 03	Piston Ø 22
5	010-2501-03 01	Piston Ø 6.5
6	005-1001-03 09	Syringe Piston Ø 1.6
7	312-0501-1554 262	O-ring Ø15.54x2.62 Silicone 60SH
8	312-0501-2189 262	O-ring Ø21.89x2.62 Silicone 60SH
9	312-0501-630 240	O-ring Ø6.3x2.4 Silicone 60SH
10	312-0505-140 125	O-ring Ø1.4x1.25 Fluocarbon 80SH
11	010-2501-03 10	O-ring spacer
12	363-0201-030 100	Screw K 30 x 10

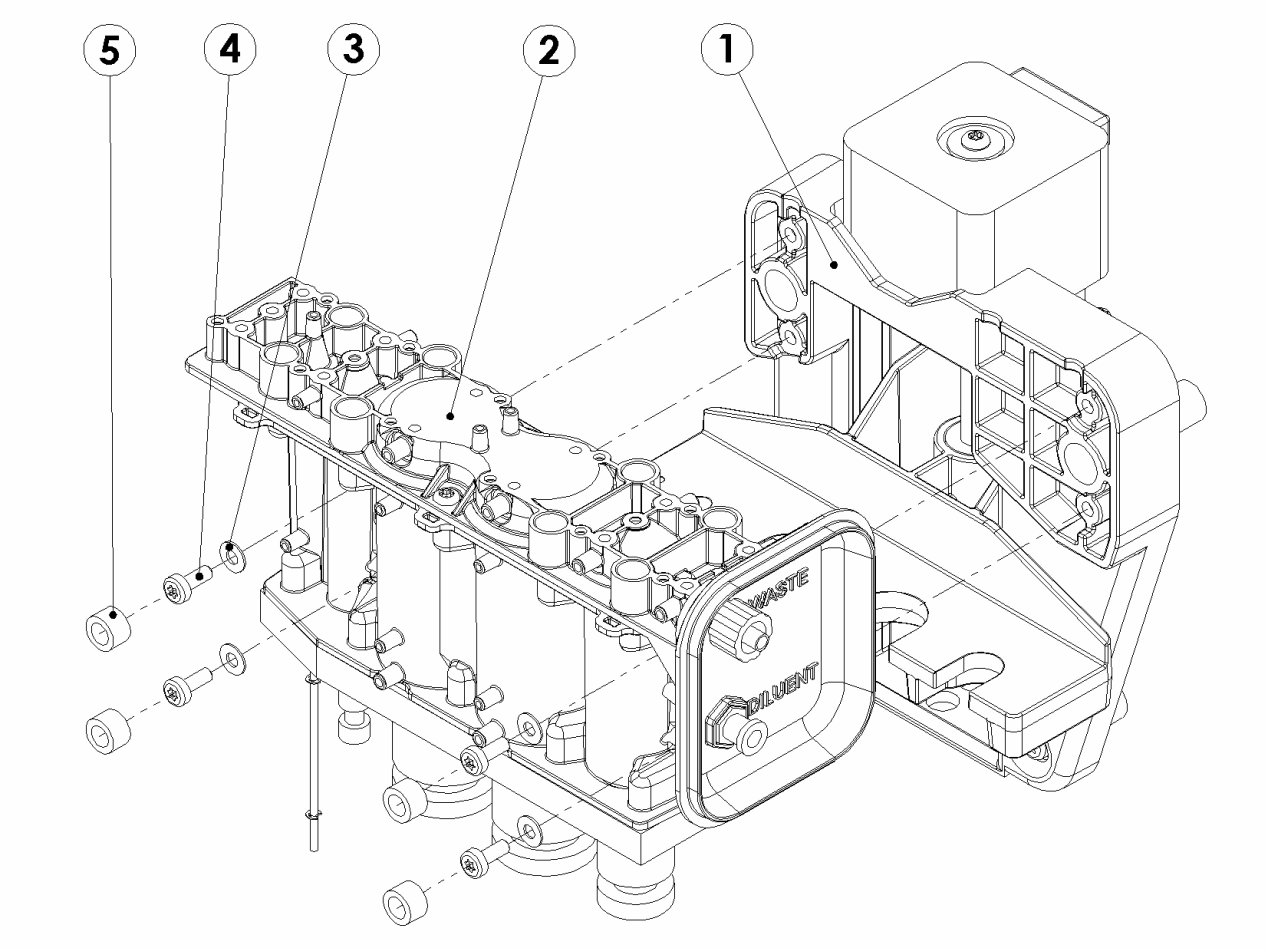
 Copyright© Orphée SA. All Rights Reserved.



Rep	Part Number	Designation
1	005-1001-03 10	Syringes Motor
2	360-0101-030 080	Screw CZX M3 x 8
3	363-0201-030 100	Screw K 30 x 10
4	360-0101-040 200	Screw CZX M4 x 20
5	385-1001-04 30	Silent bloc M4
6	005-1001-82 880 250	Syringe Optical Sensor
7	363-0201-030 080	Screw K 30 x 8

Copyright© Orphée SA. All Rights Reserved.

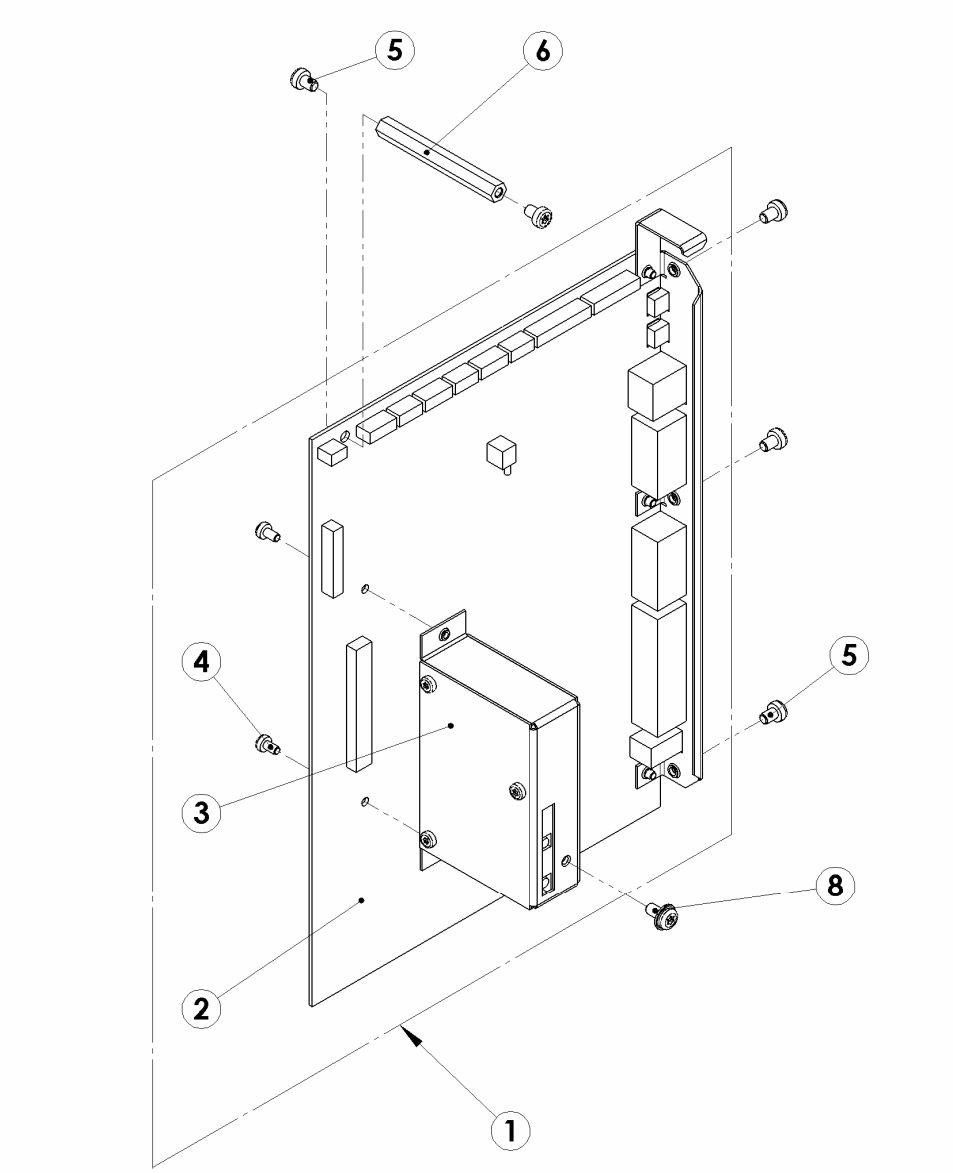
6. PARTS LISTE & BLOW UP VIEW



Rep	Part Number	Designation
1	005-1001-03 07	Syringes motor holder
2	002-1001-03 05	Syringes body
3	360-4002-030	Plain washer Ø3
4	360-0101-030 080	Screw CZX M3 x 8
5	005-1001-90 26	Tubing 26

Copyright© Orphée SA. All Rights Reserved.

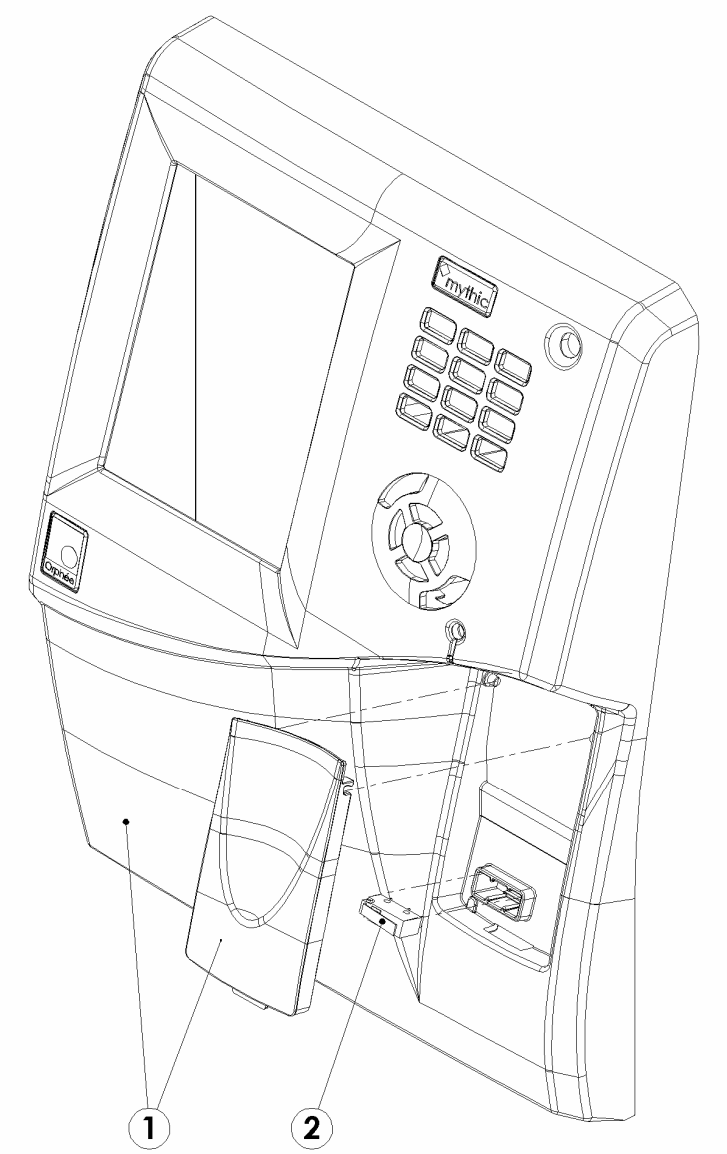
6.2.4 CPU-PREAMPLIFIER Module



Rep	Part Number	Designation
1	002-2001-04	Mythic 18 CPU & Preamplifier board
2	205-1001-01	Mythic 18 CPU board
3	205-1001-03	Mythic 18 Preamplifier board
4	360-0101-030 060	Screw CZX M3 x 6
5	360-0101-040 060	Screw CZX M4 x 6
6	360-6203-040 600	Hexagonal spacer FF M4 x 60
8	360-0102-040 080	Screw RLX M4 x 8

Copyright© Orphée SA. All Rights Reserved.

6.2.5 Front cover Module



Rep	Part Number	Designation
1	005-1001-04 02	Front cover
2	005-1001-84 06 170	Start key Switch

 Copyright© Orphée SA. All Rights Reserved.

7. SOFTWARE

7.1 INTRODUCTION

Please refer to the User's Manuel for explanation of the software operation.

7.2 SPECIFIC TECHNICIAN DISPLAY

The following section describe the software operation which are only accessible with the technician and super technician passwords.

7.2.1 Technician password

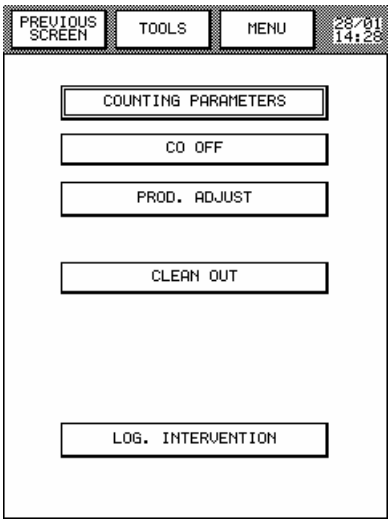
The unmodified technician password is : **8SUP**.

	- It is strictly forbidden to disclose the technician password to the final customer. **- In such case, Orphée guarantee will not be valid.**

7.2.2 Technician display

The technician display are accessible from MAIN SCREEN then SERVICE then TECHNICIAN.

7.2.2.1 Technician



- COUNTING PARAMETERS allows access to the adjustment of the counting parameters and lysis quantity. These adjustments are possible with the super technician code only.

- For an access to the latex adjustment and HGB blanc adjustment press PROD. ADJUST

- CO OFF allows to test the aperture current.

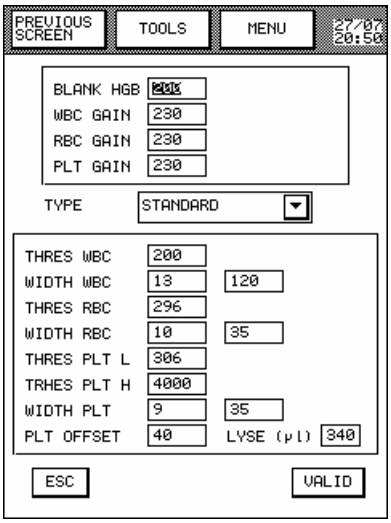
- CLEAN OUT see section **8.3**.

- LOG. INTERVENTION allows to fill up the log accessible from the MAIN MENU.

 Copyright© Orphée SA. All Rights Reserved.

7.2.2.2 Counting parameters

	- The modification of one of these parameters must be done in compliance with Orphée after having performed a specific training. **- In this case of modification without authorization, Orphée guarantee will not be valid.**



- The access of this display is available with the super technician password only

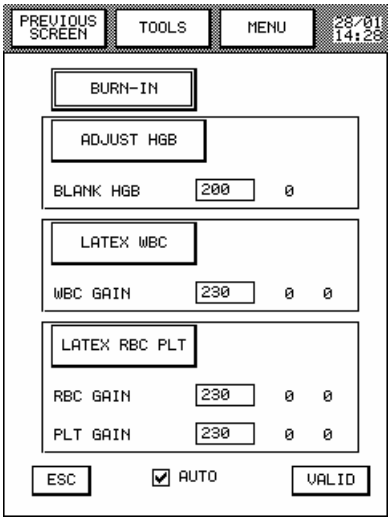
- The twenty types of blood can be changed and selected with the type window : STANDARD

- This display enables to modify the HGB, WBC, RBC and PLT gain located in the upper window and the counting pulse parameters in the lower window.

- In case of using a different lysis, the lysis quantity can be modified in the lowest window located on the right.

7.2.2.3 Prod. adjust

	- The modification of one of these parameters must be done in compliance with Orphée after having performed a specific training. **- In this case of modification without authorization, Orphée guarantee will not be valid.**



- BURN-IN Not available : manufacturing parameters.

- ADJUST HGB allows to adjust the HGB blanc level.

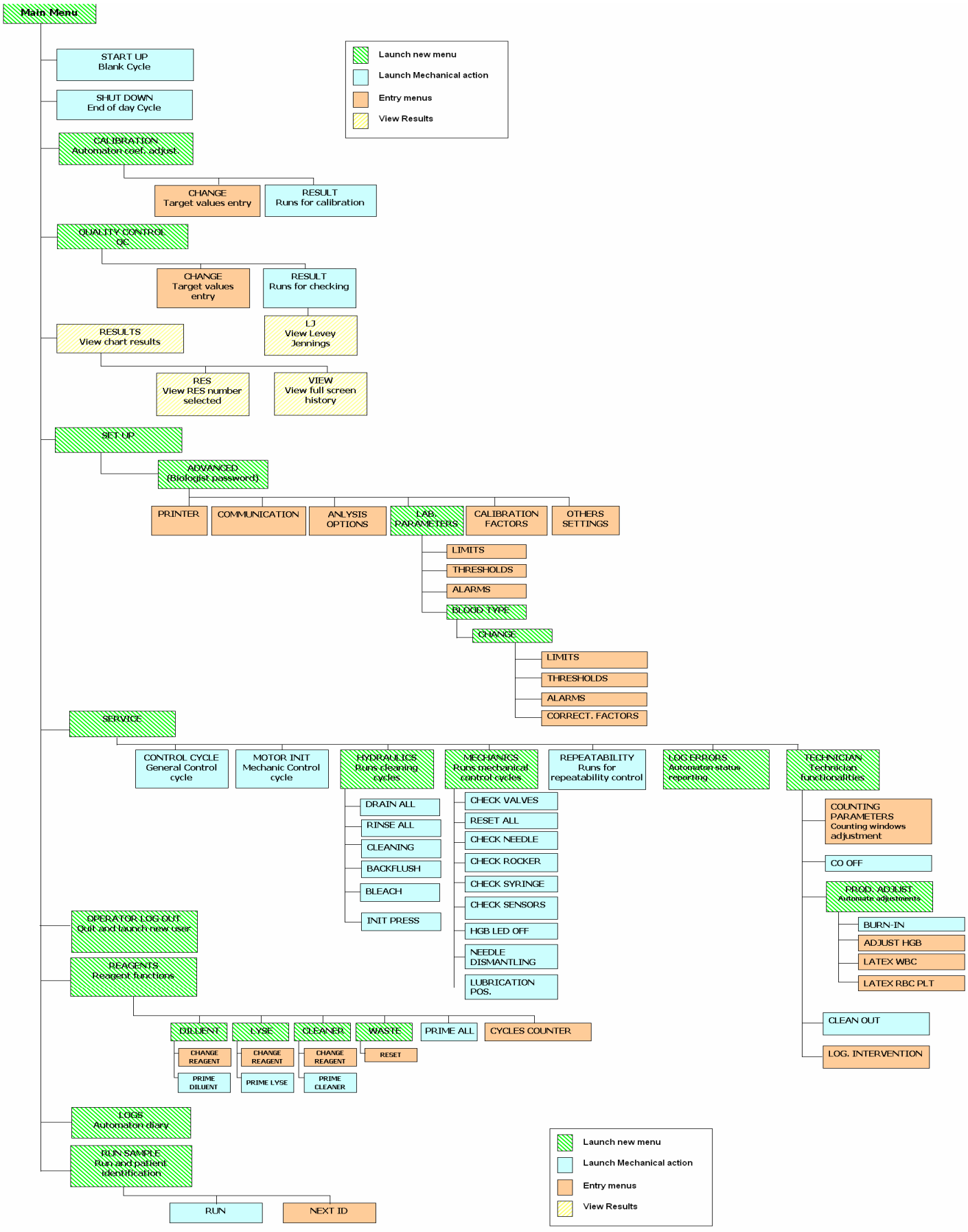
- LATEX WBC allows to adjust the WBC gain with the use of special latex particles.

- LATEX RBC PLT allows to adjust the RBC and PLT gain with the use of special latex particles.

- ☑ AUTO : Tag means that the adjustments are automatically done.

 Copyright© Orphée SA. All Rights Reserved.

7.2 SOFTWARE ARBORESCENCE



 Copyright© Orphée SA. All Rights Reserved.

8. MAINTENANCE

The quality of the results and the reliability of the **MYTHIC 18** are directly linked to the strict respect of the maintenance hereafter described.

To perform the maintenance and the repair described in this section, it is mandatory to wear rubber gloves and wash hands with a disinfectant after completion of work.

8.1 MAINTENANCE TABLE

NOTA : This table is valid for an average number of 50 samples per day. For more, please increase proportionally the number of maintenances.

MAINTENANCE	DAILY		WEEKLY		MONTHLY		HALF A YEAR		ANNUALLY	
	User	Tech	User	Tech	User	Tech	User	Tech	User	Tech
Reagents level	X									
Start Up	X									
Automatic cleaning	X									
Concentrate cleaning					X					
Shut down	X									
Cover cleaning	X									
Piston greasing							X			X
Needle o-ring replacement										X
Syringes o-ring replacement										X
Motor screw greasing										X

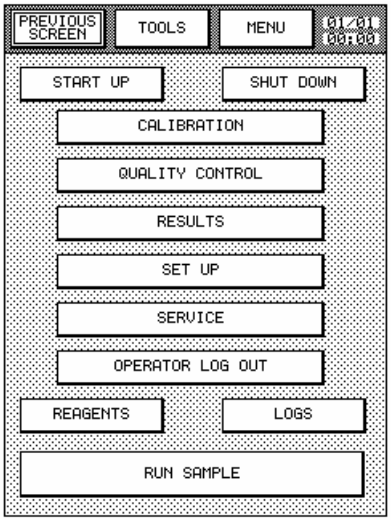
- Reagents level control : see User's Manual.
- Start up : see User's Manual.
- Automatic Cleaning : see User's Manual.
- Concentrated cleaning : see User's Manual.
- Shut down : see User's Manual.
- Cover cleaning : see User's Manual.
- Piston greasing : see User's Manual.

- Needle o-ring replacement : see section 9.2.1
- Syringes o-ring replacement : see section 9.4.2
- Motor screw greasing : This operation is described during the ORPHEE training.

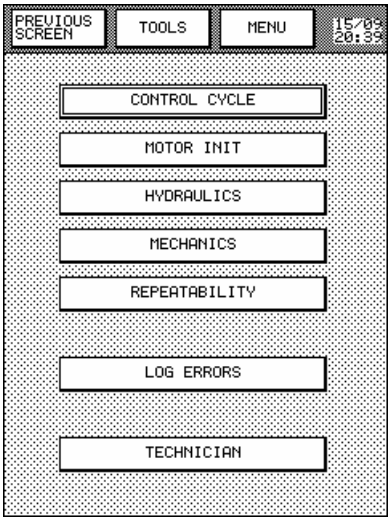
Copyright© Orphée SA. All Rights Reserved.

8.2 CONCENTRATED CLEANING

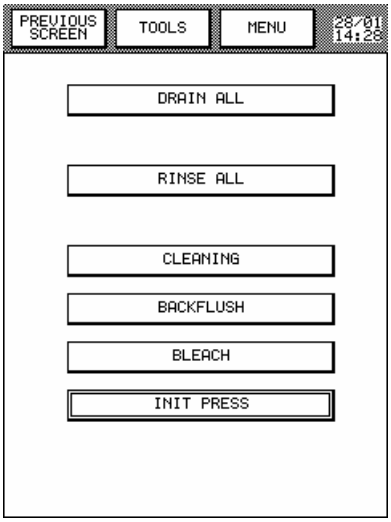
Such cleaning is necessary when **MYTHIC 18** is in permanent rejection for one measured parameter.
Prepare a Sodium Hypochlorite solution at 12° in chloride (diluted 4 times with distilled water if sodium hypochlorite is concentrated at 48° in chloride).



- Return to the main menu by pressing MENU.
- Then press SERVICE.



- Press HYDRAULICS.



- Press BLEACH to start the cycle (drain the counting chamber).

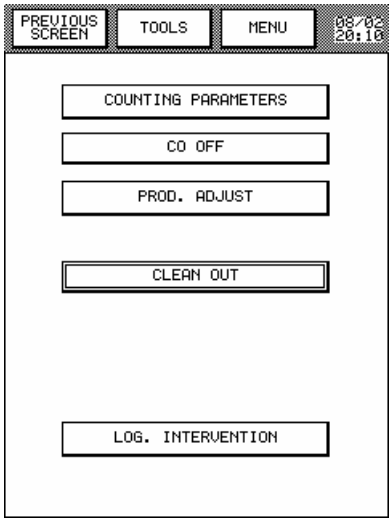
 Copyright© Orphée SA. All Rights Reserved.

- Wait for the information window.
- Open the door on the right side (see section 1.1.3).
- Put 2 ml of sodium hypochlorite solution in each counting chamber.
- Press the button in the window located in the middle of the screen.
- **MYTHIC 18** performs a maintenance cycle of the apertures followed by a stand by mode during 2 min.
- After 2 min. **MYTHIC 18** rinses all of the elements. Operator can perform an analytic cycle.
-

	Wear rubber gloves and wash hands with a disinfectant after completion of work.

8.3 CLEAN OUT

This procedure has to be used when the **MYTHIC 18** must be transported for a long distance by car, train or plane. This procedure consists of cleaning the MYTHIC 18 with sodium hypochloride, then rinsing it with distilled water and drying it before the transportation.



The clean out is accessible from MAIN SCREEN then SERVICE then TECHNICIAN.

- Press CLEAN OUT

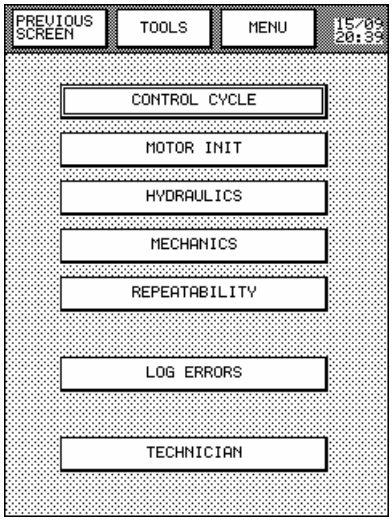
Copyright© Orphée SA. All Rights Reserved.

9. REPAIRING

	For all the following operations wear rubber gloves and wash hands with a disinfectant after completion of work. **Be careful with the edge of the metal sheets after having dismantled of the covers.**

9.1 EMERGENCY STOP

In case of mechanical or hydraulic problem, immediately press , the **MYTHIC 18** will make a emergency stop.



- After having identified the problem, it is necessary to perform a Control cycle.

- For an access to this cycle, press

from the MAIN MENU, then press

9.2 SAMPLING MODULE

9.2.1 Needle replacement

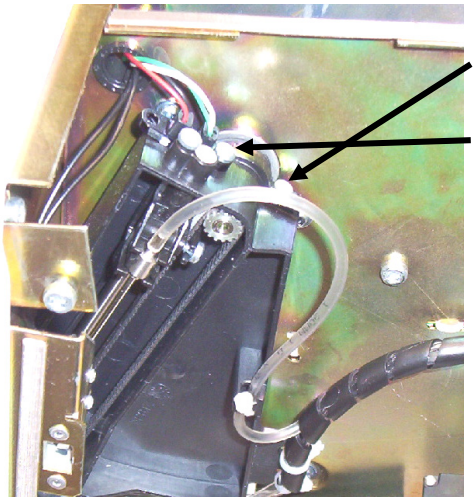
Perform needle replacement as is describe in the User's Manual.

9.2.2 Complete rocker module replacement

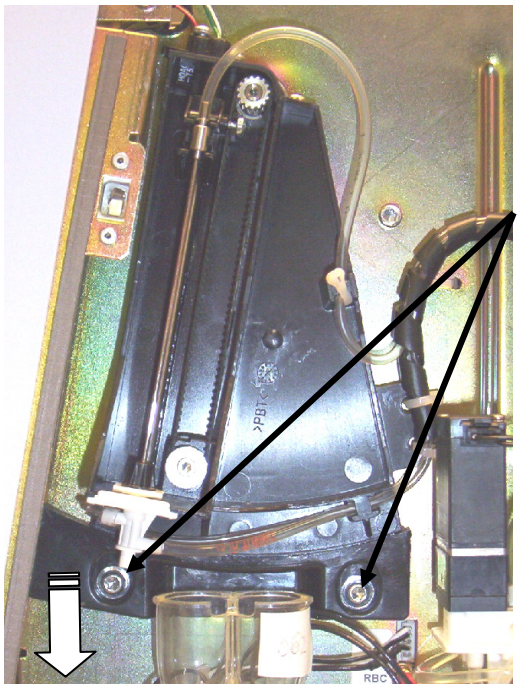
- Before to replace the complete syringe module drain all the tubing :
  - Remove the diluent, lysis and cleaner straw from their bottle
  - Perform a PRIME ALL (MAIN MENU / REAGENT / PRIME ALL)
- Switch off the MYTHIC and disconnect the power supply.
- Remove the Lysis and Cleaner bottle from their location

- Remove the upper cover (three screws) from the MYTHIC.

Copyright© Orphée SA. All Rights Reserved.



- Unscrew the rocker fixation screw but **DO NOT** remove it.
- Unscrew and remove the screw which maintain the IR barrier.



- Disconnect the three tubing and cut the ties.
- Unscrew the two guide screw but **DO NOT** remove it.
- Then slide down the guide
- Remove the complete rocker module.

REASSEMBLY PROCEDURE :

To reassemble the unit, carry out the various operations in the opposite direction.

Copyright© Orphée SA. All Rights Reserved.

9.3 COUNTING BATHS MODULE

9.3.1 Baths dismantling

Perform baths dismantling as described in the User's Manual.

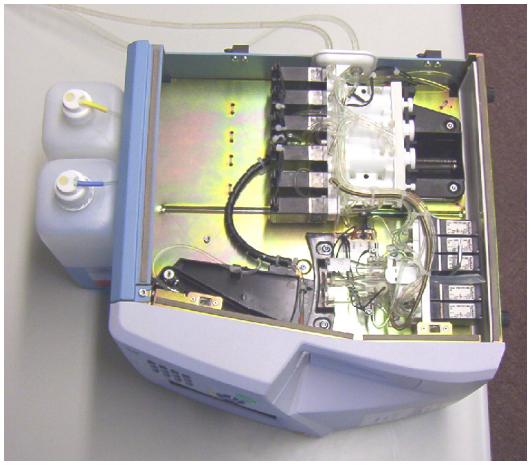
9.3.2 Baths o-ring replacement

Perform baths o-ring replacement as described in the User's Manual.

9.3.3 Aperture block replacement

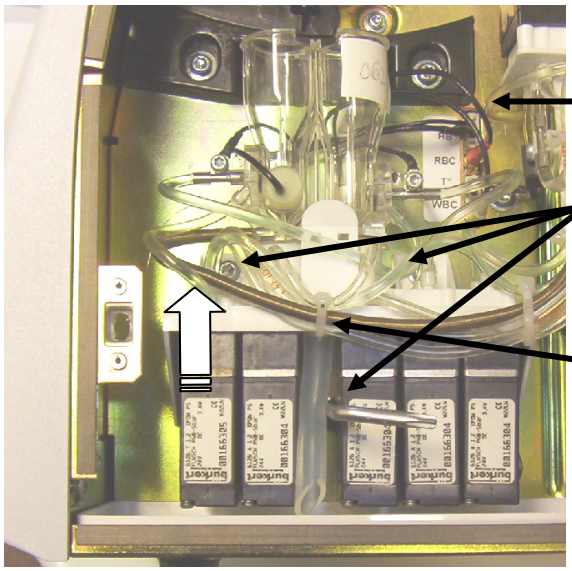
Perform aperture block replacement as described in the User's Manual.

9.3.4 Complete baths module replacement



- Before to replace the complete syringe module, drain all the tubing :
  - Remove the diluent, lysis and cleaner straw from their bottle
  - Perform a PRIME ALL (MAIN MENU / REAGENT / PRIME ALL)
- Switch off the MYTHIC and disconnect the power supply.
- Remove the Lysis and Cleaner bottle from their location

- Then put the MYTHIC on its left side.



Remove the baths connection (HGB, WBC coaxial, RBC coaxial and thermal captor).

Unscrew (but **WITHOUT** dismantle them) the three screws which maintain the baths module (the third screw is located behind the over flow tubing).

Cut the fixation ties of the tubing.

Disconnect the tubing from the manifold and the bath.

Slide up and remove the baths module.

NOTA : Take care about the tubing reconnection, if necessary, cut few millimeters (2 to 3mm) of tubing or exchange them.

REASSEMBLY PROCEDURE :

To reassemble the unit, carry out the various operations in the opposite direction.

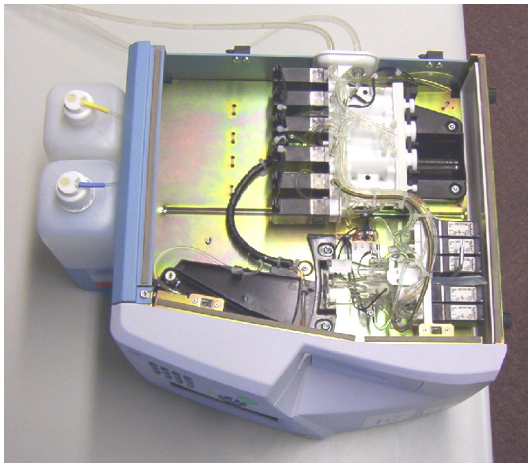
Copyright© Orphée SA. All Rights Reserved.

9.4 SYRINGE MODULE

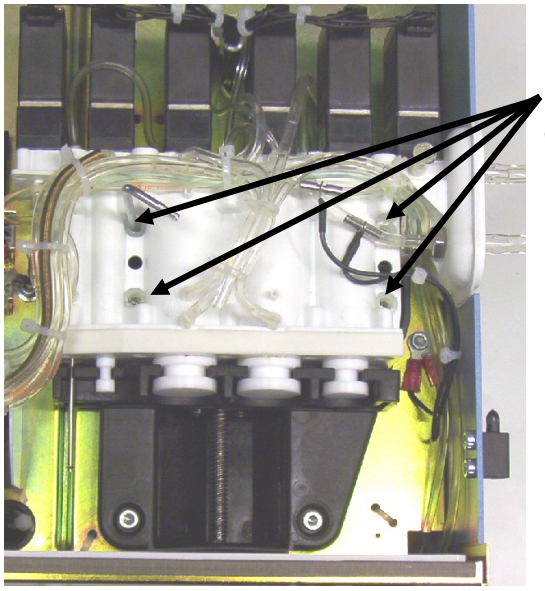
9.4.1 Piston greasing

Perform the piston greasing as described in the User's Manual.

9.4.2 O-ring or piston replacement

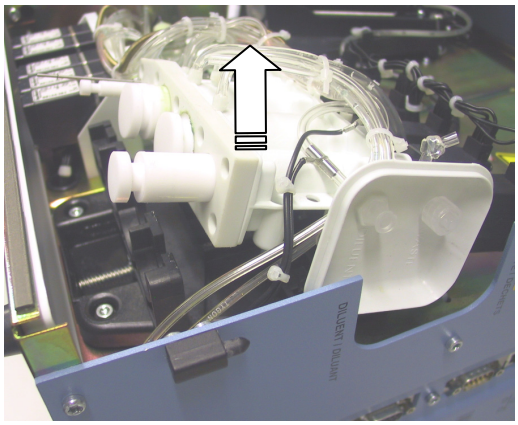


- Before replacing the complete syringe module, drain all the tubing :
  - Remove the diluent, lysis and cleaner straw from their bottle
  - Perform a PRIME ALL (MAIN MENU / REAGENT / PRIME ALL)
- Put the syringe in lubrication position (MAIN MENU / SERVICE / MECHANICS / LUBRICATE POS.)
- Switch off the MYTHIC and disconnect the power supply.
- Remove the Lysis and Cleaner bottle from their location
- Then put the MYTHIC on its left side.



- Unscrew (but **WITHOUT** dismantle them) the four screws which maintain the syringe module.

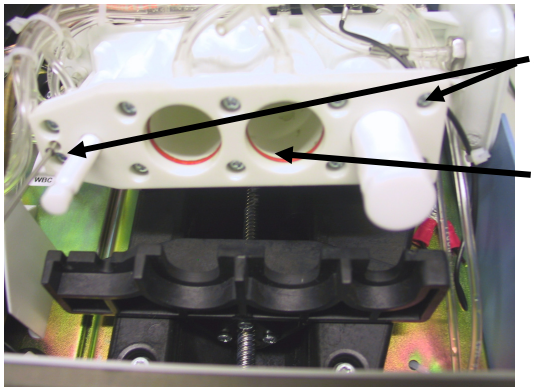
.



- Lift the bloc, to exit the syringe pistons from the piston carriage.

- Exchange the piston, if needed.

 Copyright© Orphée SA. All Rights Reserved.



-.Unscrew and remove the eight screws which maintain the o-ring plate.

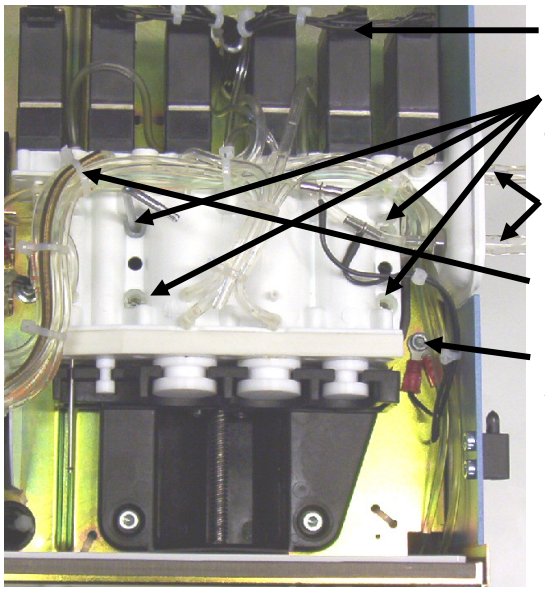
- Remove the o-ring plate and exchange the o-rings.

REASSEMBLY PROCEDURE :

To reassemble the unit, carry out the various operations in the opposite direction.

9.4.3 Complete syringe module replacement

Before exchanging the complete syringe module, put the MYTHIC on its left side as describe above (section 9.4.2).



- Disconnect all the valves connection.

- Unscrew (but **WITHOUT** dismantle them) the four screws which maintain the syringe module.

- Remove the waste and diluent tubing.

- Cut the fixation ties of the tubing.

-.Unscrew and remove the screws which maintain the ground fitting.

- Disconnect the tubing.
- Remove the complete syringe module.

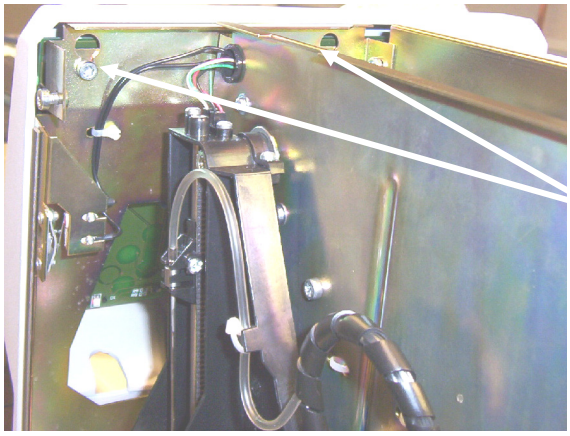
NOTA : Take care about the tubing reconnection, if necessary, cut few millimeters (2 to 4mm) of tubing or exchange them.

Copyright© Orphée SA. All Rights Reserved.

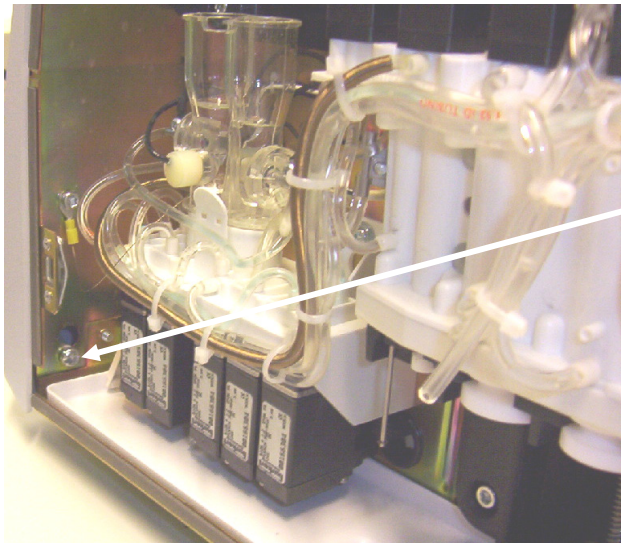
9.5 BOARDS REPLACEMENT

THE THREE BOARDS OF THE MYTHIC 18 ARE VERY SENSITIVE TO ELECTROSTATIC DISCHARGE, YOU HAVE TO USE A BODY EARTH CONNECTION TO HANDLE THE BOARDS FOR THEIR REPLACEMENT OR DISMANTLING.

9.5.1 GUI board replacement

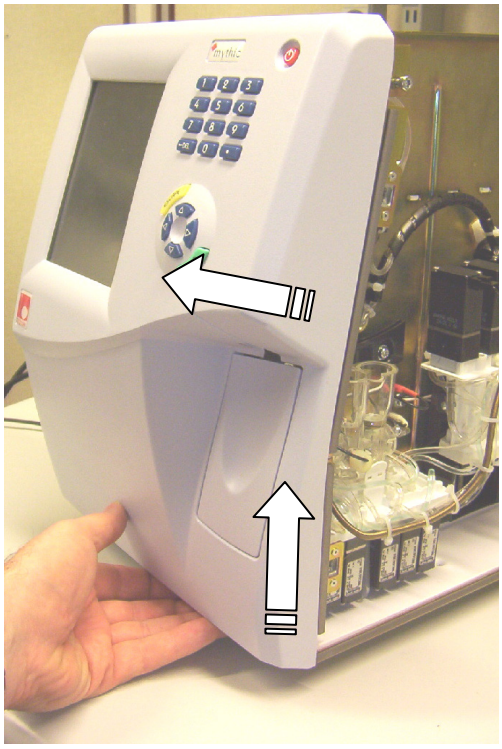


Unscrew (but **WITHOUT** dismantle them) the two upper screws which maintain the front panel.

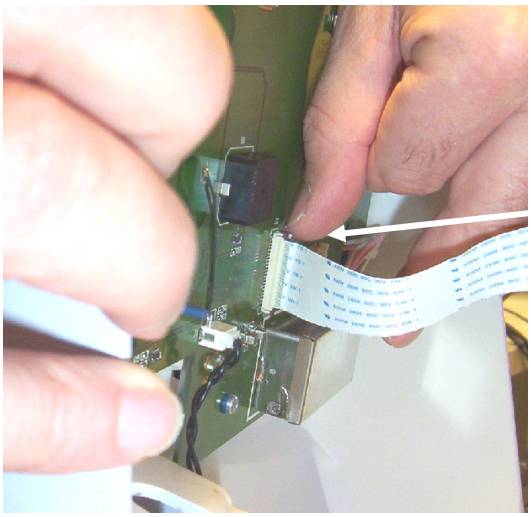


Unscrew (but **WITHOUT** dismantle it) the lower screw which maintain the front panel.

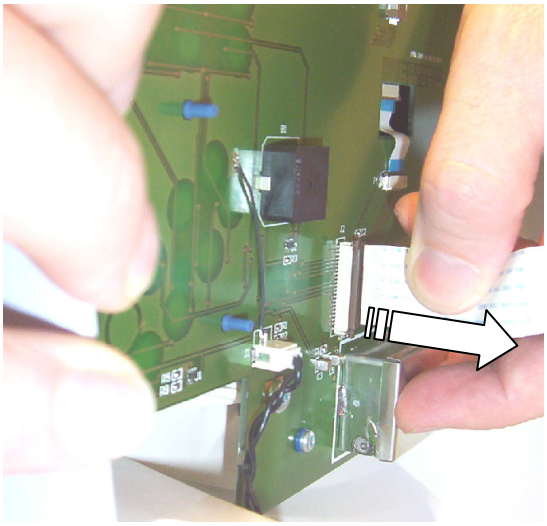
Copyright© Orphée SA. All Rights Reserved.



Lift the front panel and then pull it toward the front of the instrument.



VERY CAREFULLY and SLOWLY push on the upper side of the connector, and then push on the lower side to up the fixing system .
This part is **VERY** sensitive.
In case of brake, the complete GUI board have to be changed.

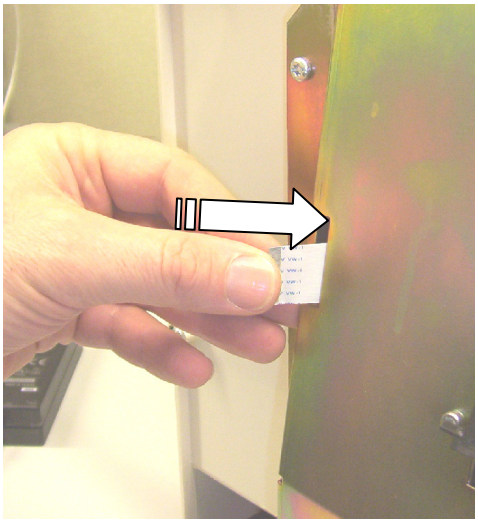


VERY SLOWLY pull the flat cable outside the connector.

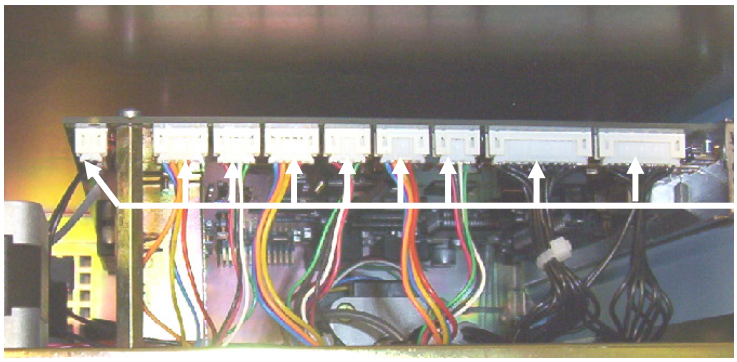
Copyright© Orphée SA. All Rights Reserved.

9.5.2 Main board replacement

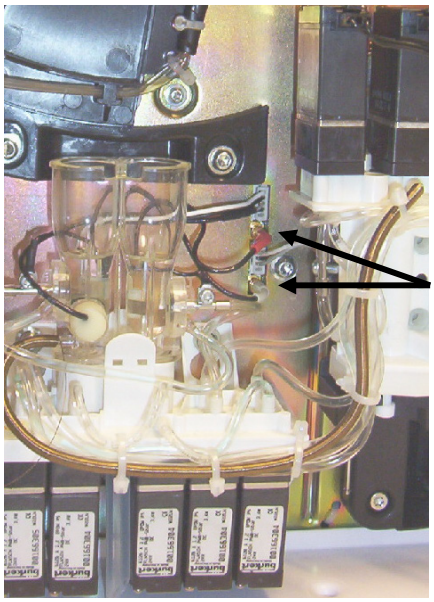
NOTA : Before to dismantle the main board, dismantle the GUI board (see section 3.4.1).



VERY SLOWLY push the flat cable inside the window.

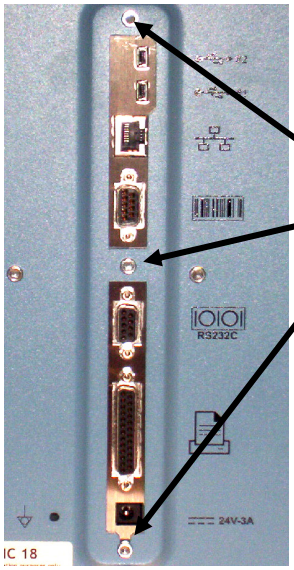


Remove the nine connectors located at the top of the board

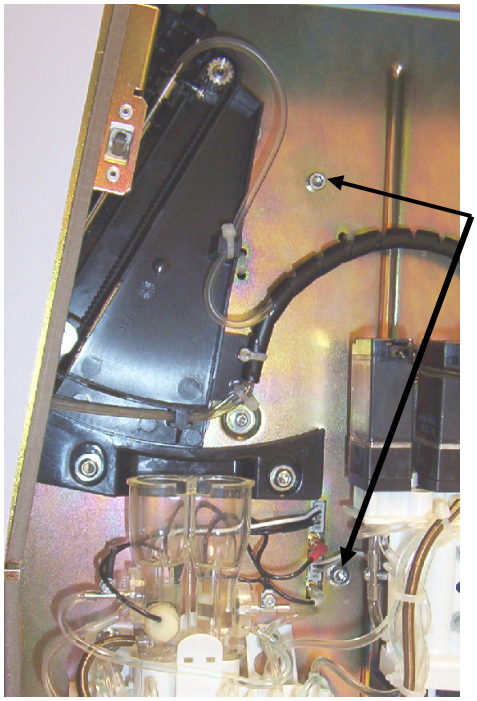


Remove the baths connection (HGB, WBC coaxial, RBC coaxial and temperature sensor).

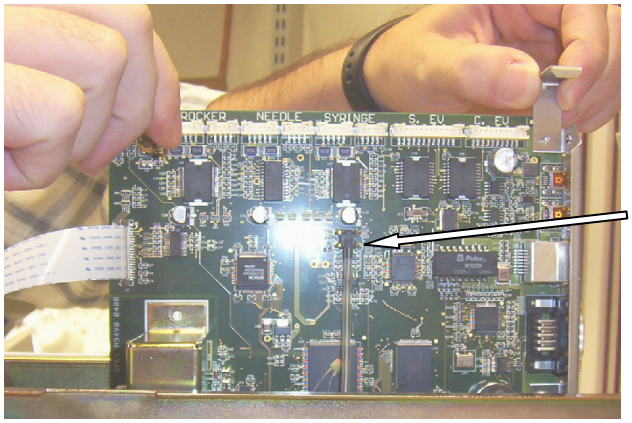
 Copyright© Orphée SA. All Rights Reserved.



Remove this three screws at the back of the instrument.



Remove the two screws located at the hydraulics side.



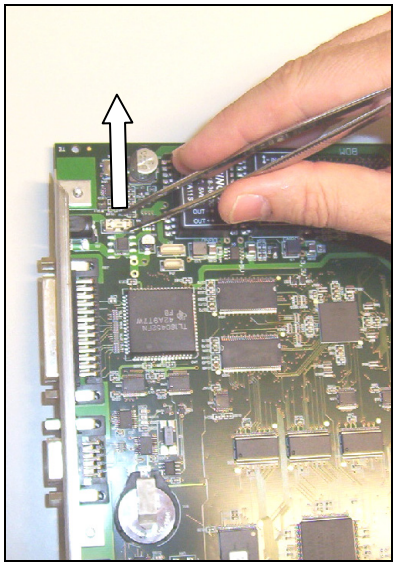
Remove the vacuum tubing, then remove the board.

NOTA : After having performed the replacement of the board, don't forget to reconnect the vacuum tubing.

Copyright© Orphée SA. All Rights Reserved.

9.5.3 Main board

9.5.3.1 Fuse replacement

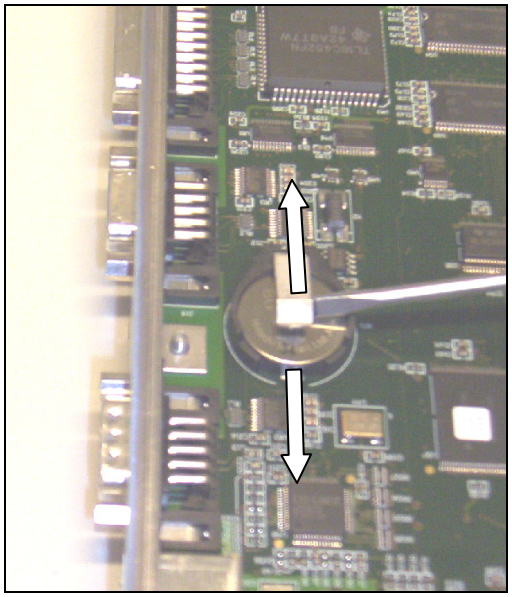


- This fuse protects the 24v circuit.

- Remove the fuse with a thin pliers and replace it by a new one.

	- Use a Littelfuse NANO² Slo-Blo fuse model 0454 004 to replace the old one. **- It's strictly forbidden to use an another type of fuse.**

9.5.3.2 Battery replacement



- This battery is only used to supply the real time clock.

- With a screwdriver lift the clips maintaining the battery.
- Slip down the battery to remove it and replace it by a new one.

	- Use a Maxell battery model CR2016 to replace the old one. **- It's strictly forbidden to use an another type of battery.**

	READ CAREFULLY THE FOLLOWING RECOMMENDATIONS.

Handling/storage

Never expose the battery to ultrasonic sound.

Exposing the battery to ultrasonic sound may cause short-circuiting because the inside material is broken into pieces, leading to distortion, leakage, overheating, explosion, or fire.

Never subject the battery to severe shock.

Dropping, throwing or stomping on the battery may cause distortion, leakage, overheating, explosion, or fire.

Copyright© Orphée SA. All Rights Reserved.

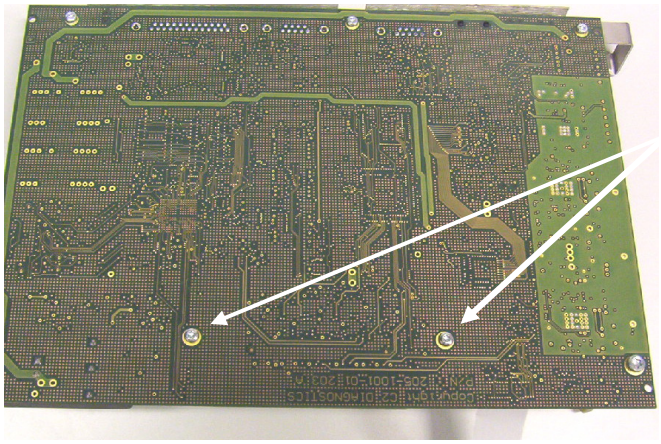
Never short-circuit the battery while installing into equipment.
Please be careful when installing the battery not to short-circuit it with metal portions of the equipment.
Use the correct battery suitable for the equipment.
The battery may not be suitable for the specific equipment due to the using conditions or type of equipment. Please select the suitable battery according to the handling instructions of the equipment.
Never use or leave the battery in a hot place such as under the direct rays of the sun or in a car in hot weather.
If you do, this may cause distortion, leakage, overheating, explosion, or fire.
Never allow the battery to come in contact with water.
If it does, this may cause the battery to rust or lead to distortion, leakage, overheating, explosion, or fire.
Never store the battery in a hot and highly humid environment.
Doing so may cause the performance of the battery to deteriorate. In certain environments, this may lead to distortion, leakage, overheating, explosion, or fire.

Disposal
The battery may be regulated by national or local regulation. Please follow the instructions of proper regulation. As electric capacity is left in a discarded battery and it comes into contact with other metals, it could lead to distortion, leakage, overheating, or explosion, so make sure to cover the (+) and (-) terminals with friction tape or some other insulator before disposal.

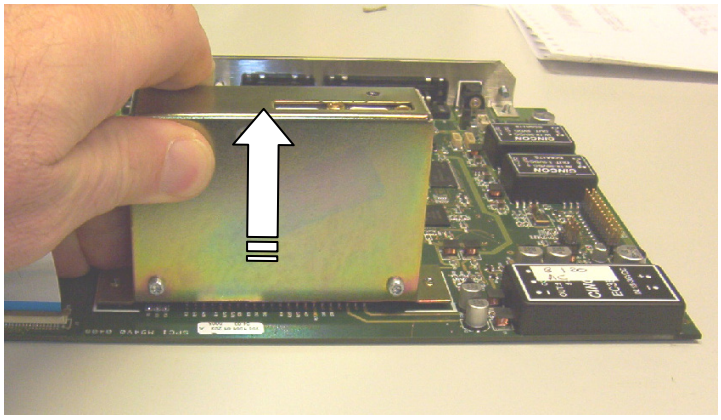
 Copyright© Orphée SA. All Rights Reserved.

9.5.4. Preamplifier board replacement

NOTA : Before to dismantle the preamplifier board, dismantle the Main board (see section 5.2.1).



Remove the two screws located on the copper side.



Remove the preamplifier box from the main board.

To reassemble the part, carry out the various operations in the opposite direction.

Copyright© Orphée SA. All Rights Reserved.

10. TROUBLESHOOTING

In any case, if a problem is not solved, call Orphée's.

10.1 ANALYTICAL PROBLEMS

PARAMETERS	PROBLEMS	CONDITIONS	SOLUTIONS
WBC	No results	No HGB	Check the bath wires Check the lysis level Check the right lysis tubing connection to the WBC bath.
		HGB OK	Check the bath wires Perform a Cleaning Cycle and then a Bleach cycle if unsuccessful.
	Bad stability		Perform a Back flush and a Cleaning Cycle and then a Bleach cycle if unsuccessful Check the level bubble flow in the WBC bath during the run cycle Check the lysis quantity (see section 7.2.2.2).
RBC	No results	No HCT & PLT	Check the bath wires Perform a Cleaning Cycle and then a Bleach cycle if unsuccessful
	Bad stability	HCT & PLT too	Perform a Back flush and a Cleaning Cycle and then a Bleach cycle if unsuccessful Check the level bubble flow in the RBC bath during the run cycle Check the level bubble flow in the WBC bath during the first dilution
HGB	No results		Check the led light on
	Bad stability		Check if no bubble in the lysis tubing. Check the level bubble flow in the WBC bath during the run cycle. Check the lysis quantity (see section 7.2.2.2).

10.2 OTHER PROBLEMS

ORIGIN	PROBLEMS	SOLUTIONS
MYTHIC	Diluent leaks around the needle during the run cycle	Check the rinsing needle block (presence of clots) and clean it if necessary see section 9.3.2
	No starting	Check the power supply connection wires
	All results bad	Check the level diluent and if the tubing is pinched.
	No display	Check the flat cable.
Printer	No printing	Check the paper. Check the electrical connection.
	Bad printing	Check the black ribbon.

Copyright© Orphée SA. All Rights Reserved.

10.3 TROUBLESHOOTING MESSAGE

This section allows to know what to do when a troubleshooting message appears on the screen.

MESSAGE	ACTION
BACKUP : BAD FOLDER DUPLICATION	Re-start the Mythic.
BACKUP : CALIBRATION HISTORY IS FULL	Delete the calibration results.
BACKUP : FOLDER NOT FOUND	Re-start the Mythic.
BACKUP : MEMORY IS ALMOST FULL. PLEASE DELETE RESULTS	Delete results
BACKUP : NO MEMORY AVAILABLE FOR STORAGE	Delete the stored results.
BACKUP : QC HISTORY IS FULL	Delete the Q.C. results of the ongoing lot.
BACKUP : REPEATABILITY HISTORY IS FULL	Delete the repeatability results.
BACKUP: FILE SYSTEM FAILED	Re-start the Mythic.
BACKUP: LAST QC RESTORED.	File has been restored to previous state
BACKUP: LAST RESULTS RESTORED.	File has been restored to previous state
BACKUP: LAST SETUP RESTORED.	Indicate that your SETUP has been restored
BACKUP: PARTIAL CALI. RES. DELETED.	A bad Result storage happened
BACKUP: PARTIAL NUM DELETED.	A bad Result storage happened
BACKUP: PARTIAL QC RES. DELETED.	A bad Result storage happened
BACKUP: PARTIAL REPET. RES. DELETED.	A bad Result storage happened
BACKUP: SECTOR FAILED	hardware failure on memory
BACKUP: SETUP UPDATED WITH DEFAULT VALUES.	Indicate that your SETUP has been released
BACKUP: SYSTEM ERROR	Re-start the Mythic.
CLEAN NOT DONE	Perform a rinse cycle.
CLEANER ALMOST EMPTY	Replace the bottle and perform a prime Cleaner
COM: CRC CONTROL ERROR	Communication error retry
CONTROL CYCLE NOT DONE	Perform a control cycle.
CYCLE : BUSY	Wait before performing a cycle.
CYCLE : CMD VALVE FAILED	Change the valve
CYCLE : EMERGENCY STOP	Perform a control cycle.
CYCLE : INIT NOT DONE	Perform an initialization or a control cycle.
CYCLE : VALVE XX FAILED	Change the valve
CYCLE STOPPED BY USER	Emergency stop, please perform a control cycle.
CYCLE: DOOR OPENED	Close the door.
CYCLE: PRESSURE DEFAULT	Check the valve 8 and the pressure sensor tubing
DILUENT ALMOST EMPTY	Replace the container and perform a prime Diluent
HARDWARE: SYSTEM ERROR	Re-start the Mythic.
ID AND/OR PID MANDATORY (CHECK SETUP). SID ALWAYS MANDATORY	Enter an ID and/or PID and SID
INIT PRINTER	Switch on the printer or invalidate the printings.
INTERN : COUNT ERROR	Re-start the Mythic.
INTERN: MEMORY CORRUPTED	Re-start the Mythic.
INTERN: NO MEMORY AVAILABLE	Re-start the Mythic.
INTERN: RESULT AREA IS LOCKED	Wait before performing a cycle. If persisting, re-start the Mythic.
LYSE ALMOST EMPTY	Replace the bottle and perform a prime Lysis

 Copyright© Orphée SA. All Rights Reserved.

MESSAGE	ACTION
MECA : HOME ROCKER NOT FOUND	Perform an INIT MOTOR or a CONTROL CYCLE.
MECA : HOME NEEDLE NOT FOUND	Perform an INIT MOTOR or a CONTROL CYCLE.
MECA : HOME SYRINGE NOT FOUND	Perform an INIT MOTOR or a CONTROL CYCLE.
MECA : MOTOR NEEDLE GAP	Nothing.
MECA : MOTOR ROCKER GAP	Nothing.
MECA : MOTOR SYRINGE GAP	Nothing.
MECA : NEEDLE NOT IN TOP POSITION	Perform a CONTROL CYCLE.
MECA: MOTOR NEEDLE BUSY	Re-start the Mythic.
MECA: MOTOR ROCKER BUSY	Re-start the Mythic.
MECA: MOTOR SYRINGE BUSY	Re-start the Mythic.
NO PRINTER RESPONSE	Switch on the printer or invalidate the printings.
NO PRINTER RESPONSE	Switch on the printer or invalidate the printings.
NO PRINTER SELECTED	Switch on the printer or invalidate the printings.
OUT OF RANGE	Modify the value
PRINTER ERROR	Switch on the printer or invalidate the printings.
PRINTER IS BUSY	Switch on the printer or invalidate the printings.
PRINTER IS OFF	Switch on the printer or invalidate the printings.
PRINTER: NO PAPER	Add some paper.
RINSE NOT DONE	Perform a RINSE ALL cycle.
RS232: ACK ERROR	Re-start the Mythic.
RS232: INTERNAL ERROR	Re-start the Mythic.
RS232: SYNCHRO ERROR	Re-start the Mythic.
RS232: TIME OUT	Re-start the Mythic.
RUNNING AUTO CLEANING ,	Press OK.
START UP CYCLE FAILED	Perform a new start up cycle
START UP CYCLE NOT DONE	Perform a start up cycle.
SVM: BAD VERSION.	Update the SVM software
SVM: COM. TIME OUT	Re-start the SVM.
SVM: ILLEGAL SERIAL NUMBER.	This MYTHIC can not be connected to the SVM
SVM: UNMATCH	Re-enter the file or confirm it (manual connection on the SVM).
SVM: WG	Westgard alarm.
SVM: XB	XB alarm.
SYSTEM : EEPROM COM ERROR	Re-start the Mythic.
SYSTEM : INTERNAL TIME OUT	Re-start the Mythic.
SYSTEM: FATAL ERROR	Re-start the Mythic.
THE CLEANER USED IS OUT OF DATE	Replace the bottle and perform a prime Cleaner
THE DILUENT USED IS OUT OF DATE	Replace the container and perform a prime Diluent
THE LYSE USED IS OUT OF DATE	Replace the bottle and perform a prime Lysis
WASTE ALMOST FULL	Replace the waste container

 Copyright© Orphée SA. All Rights Reserved.